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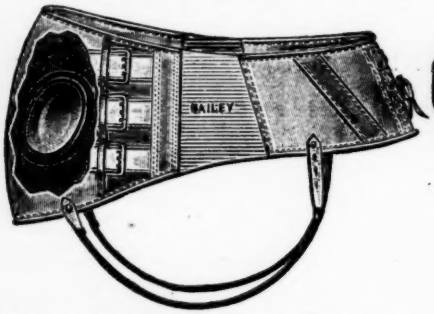

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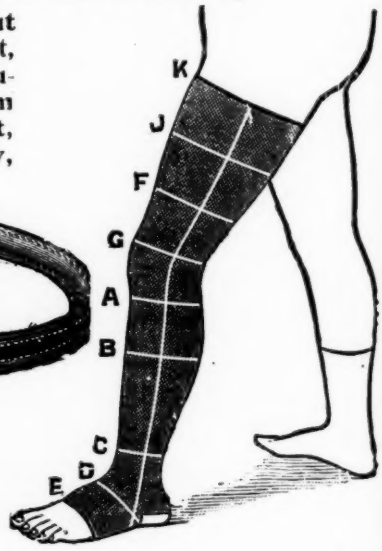

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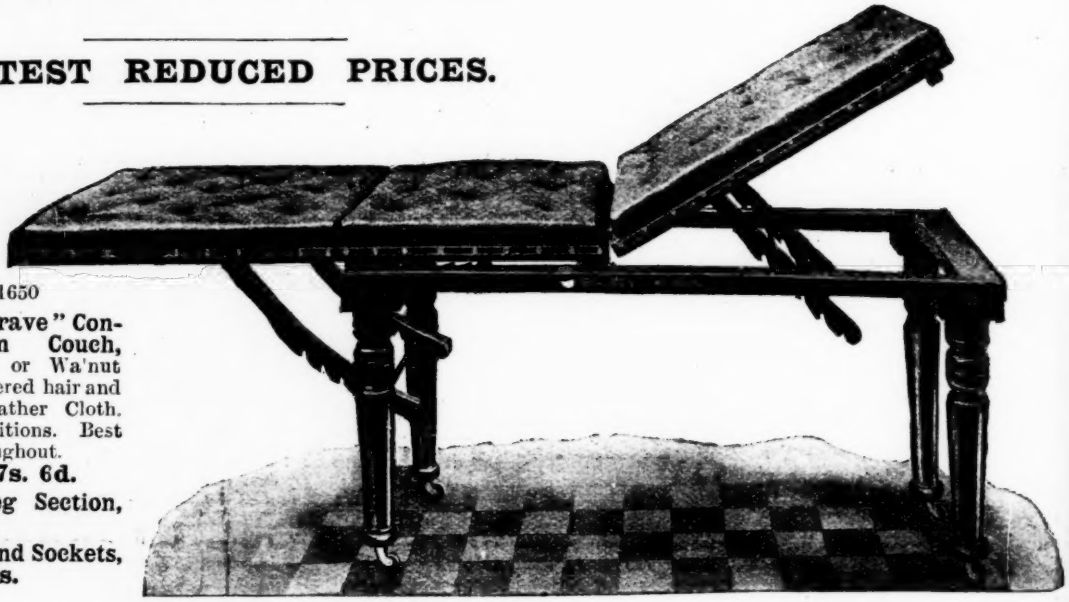

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An Address
ON
SOME ASPECTS OF CHOLELITHIASIS.

DELIVERED BEFORE THE LISTERIAN SOCIETY, KING'S COLLEGE HOSPITAL, ON JANUARY 21ST, 1925,

BY

SIR BERKELEY MOYNIHAN, BT., K.C.M.G.,
M.S.LOND., F.R.C.S.,
SENIOR SURGEON, LEEDS GENERAL INFIRMARY.

THE surgery of cholelithiasis has two objects: it is concerned primarily with the health or the rescue of the individual patient; it is now concerned also with an attempt to discover the causes of the condition, so that its prevention may, in some degree at least, become possible. Research, no less than therapy, is an aim of all the methods of surgery.

In an investigation of cases of cholelithiasis the conclusion has been reached that two factors are of chief importance in respect of causation: infection, and an increase in the cholesterol content of the blood.

Infection may be derived from any source—from the teeth; from the facial sinuses; from any part of the alimentary canal; from the urinary system; from other foci within, or without, the abdomen. Theoretically there is no infection which cannot, when uncontrolled, gain access to the blood and so find its way to any part of the body. The infections so arising find their way to the gall bladder by several routes. If they are alimentary in origin they may ascend from the duodenum along the common duct; they may reach the liver, through the portal circulation, and thence descend with the bile. They may be borne by the blood, or by the lymph stream; or may attack the gall bladder by direct invasion from a neighbouring organ. The immediate effect produced upon the gall bladder varies in different instances. If contaminated bile is the direct source of the infection the mucosa is first attacked, and the inflammatory changes pass outwards through all the walls of the gall bladder. If the disease is blood-borne, little clumps of organisms are first seen in the submucosa, and a crowd of leucocytes surrounds them. The inflammatory process thence extends inwards to the mucosa and perhaps outwards to the peritoneum. The infection of the gall bladder found in typhoid fever seems to start with great frequency in this fashion. If the invasion occurs through the lymph stream or by direct contiguity, the serosa is first infiltrated by organisms, which make their way slowly inwards towards the mucosa. Sections made of the gall bladder have demonstrated quite clearly these several paths of infection. In cases of multiple gall stones infection is invariably present in the gall-bladder wall. The view has been expressed that infection is the consequence, and not one of the chief causes, of the development of calculi. Such evidence as I have been able to gather seems to indicate quite indisputably that infection always precedes the deposit of stones. Indeed, our search now inclines to the recognition of infection in the gall bladder during the period before the stones are formed. The most frequent agent of infection in the gall bladder is the *Bacillus coli*. It is found in all stages of cholelithiasis, from the earliest to the most advanced. Table I shows this unmistakably. In many cases of cholelithiasis a history of other forms of *B. coli* infection, especially of the urinary tract, may often be elicited. Women are afflicted with gall stones at least twice as often as men. They are apt to suffer from bacilluria; and in the periods of pregnancy pyelitis or cystitis of *B. coli* origin is no uncommon event. There would appear to be a connexion between the infections of the urinary tract and those of the gall bladder. Walton in particular has emphasized the truth of this observation.

The infection which sets going a process of calculus formation must be mild and is often recurrent; it waxes and wanes. If it is severe an acute cholecystitis develops, and gangrene or perforation may occur. As this acute infection subsides it may leave a crippled gall bladder incapable alike of secreting or of discharging its contents; and stasis and a milder sepsis may then together lead to the growth of stones. If the infection is mild there appear to be pauses in the growth and activity of the organisms, for after cholecystectomy the bile may be found sterile, and the walls of the gall bladder, though crowded with organisms, may show only an attenuated growth, or even none, on culture. The incidence, the abeyance, and the recurrence of infection are shown by the existence of several generations of stones in the gall bladder, each generation having stones of the same size—larger if of older date, smaller if more recent. Three generations are often found.

When infection, from whatever source derived, reaches the cavity of the gall bladder, where an excess of mucus is quickly secreted and produces stagnation, the process of calculus formation may begin. An examination by *x* rays of the gall bladder after removal shows that, as a rule, the smaller the stone the larger the proportion of cholesterin that it contains—the smaller stones, that is, are almost translucent. As they grow larger calcium begins to be deposited upon a spot here and there; the area covered increases, and finally the complete closure of a cholesterin nucleus in a calcium capsule may be seen. In other instances the calcium seems to infiltrate the stone, stealing in towards the centre. In still others the nucleus of the stone is a dark spot of calcium and cholesterin is deposited around it. The calcium is no doubt derived in part from the mucus secreted in excess and in part from the inflammatory fluids poured into the gall bladder when the infection has aroused a great response. We do not at present know why in one case cholesterin is the chief constituent of gall stones, and why in another calcium is the component. The connexion between a preponderance of cholesterin in the stones and a high cholesterol content of the blood is clearly suggested by our experience to be presently mentioned, and calcium is doubtless an evidence of a subdued, though persistent, local infection, and perhaps, too, an evidence of a deranged calcium metabolism of which in this connexion I know nothing. The infective origin of multiple gall stones can hardly be disputed; and the aphorism I ventured to express many years ago, that "a gall stone is a tombstone erected to the memory of the germs within it," remains true. These buried organisms are not always dead. I have found typhoid organisms viable twenty-eight years after the occurrence of typhoid fever; and Finney relates a case in which living typhoid organisms were found in the centre of gall stones thirty-five years after an attack of enteric fever.

TABLE I.—RESULTS IN 100 CONSECUTIVE CASES FROM WHICH CULTURES OF THE GALL BLADDER WALL WERE GROWN.

A.—*Showing the Relation between Degree of Lesion and Type of Infection.*

	Strepto-cocci.	B. coli.	Double Infec-tion.	B. pyo-cyaneus	Other Infection: B. lactis, Staphylo-coccus, Pneumo-coccus.
Early lesion	5	19	1	1	14
At acme	1	7	2	—	5
Subacute cholecystitis ...	2	14	2	1	8
Chronic cholecystitis ...	—	2	—	—	2
Empyema of gall bladder	—	4	—	—	4
Total percentage ...	8	46	5	2	33

B.—*Showing the Organisms found on Histological Examination of the same Cases.*

	In Mucosa.	In Peri-toneum.	All through.	Total.
Streptococcus	4	6	—	10
Pneumococcus, etc.... ...	17	13	3	33
B. coli	20	25	5	50
B. pyocyaneus...	2	—	—	2

So far I have spoken of multiple gall stones. On occasion we find not many stones but one only. A solitary stone is composed of pure cholesterin; it is not caused by infection, though it may set infection going by becoming impacted once or oftener in the cystic duct. It causes no "inaugural" symptoms. No evidence of its existence is given until it suddenly becomes lodged in the pelvis of the gall bladder and occludes the cystic duct. This event rarely takes place until the stone is of the size of a nutmeg. The stone is irregular and warty on the surface, like beeswax in appearance, almost translucent; and on section shows a characteristic appearance of spokes radiating from the centre. When the stone is larger calcium may be deposited between these spreading lines, or upon the surface. The solitary cholesterin stone, then, is not caused by infection, but results from a condition of hypercholesterolaemia. The diagnosis of "solitary cholesterin stone" is easily made when one remembers that none of the prodromal symptoms of cholelithiasis are present. The first symptom is an agonizing attack of pain coming quite suddenly, seizing the right half of the abdomen, piercing through to the shoulder blade, spreading across the epigastrium, and producing infinite unrest, difficulty in deep breathing, sweating, and prostration, until, in an instant, relief comes. The stone is released as quickly as it was engaged. When such events are repeated infection in the gall bladder is a necessary consequence.

The question of the cholesterol content of the blood is one for close examination in all suspected cases of cholelithiasis. With the skilful help of Dr. Cecilia Shiskin 280 patients suffering from various abdominal diseases requiring operation have been examined (Table II). Of

TABLE II.—HYPERCHOLESTEROLAEMIA IN RELATION TO DIAGNOSIS.

A.—*Types of Disease.*

Type of Disease.	Hyper-cholesterol-aemia.	"High Normal."	Total.
	Per cent.	Per cent.	Per cent.
Gall bladder cases	65.0	23.0	88.0
Gastric and duodenal cases ...	16.4	11.2	27.6
Other diseases	22.9	13.0	35.9

B.—*Details in 280 Cases.*

Nature of Case.	Cholesterol in Blood.			Total.
	Below 0.160 per cent.	160 to 0.200 per cent.	Over 0.200 per cent.	
Gall bladder disease—				
(*a*) Stone	12	29	60	101
(*b*) Cholecystitis, etc. ...	4	6	8	18
Gastric ulcer	8	13	5	26
Duodenal ulcer	26	10	5	41
Jejunal ulcer	5	—	1	6
Carcinoma (gastric, pancreatic)	8	2	4	14
Chronic appendicitis	5	9	2	16
Acute yellow atrophy	1	—	—	1
Hydatid cyst of spleen... ...	—	1	—	1
Abdominal adhesions, Visceroptosis	22	12	11	45
Pernicious anaemia	1	—	—	1
Splenic anaemia	3	—	—	3
Haemolytic jaundice	7	—	—	7
Total	—	—	—	280

these, 101 were cases of cholelithiasis. Cholesterol is a member of the important group of substances known as lipoids. It is an invariable constituent of all active cells of the body, both in its free form and in combination as ester. In disease it may occur in abnormal amounts in various organs, tissue fluids, and calculi. It is present in the blood in very variable quantities. The normal amount may be stated as 0.160 per cent., and in older people as rather more than this. For purposes of classification (Fig. 1) we regard

Less than 0.133 per cent. as indicating hypocholesterolaemia.
Between 0.133 and 0.160 per cent. as being normal.
Between 0.160 and 0.192 per cent. as being high normal.
Above 0.192 per cent. as indicating hypercholesterolaemia.

Hypercholesterolaemia is found in cases of arterio-sclerosis, chronic nephritis, diabetes, the later months of pregnancy, and in cholelithiasis.

Of 101 cases of cholelithiasis (proved by operation) 66.4 per cent were females. The average cholesterol value

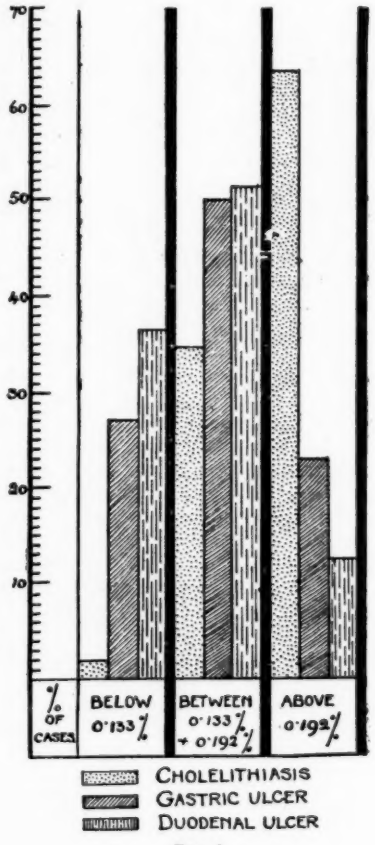

FIG. 1.

was 0.217 per cent.; 65 per cent. of cases showed hypercholesterolaemia; 23 per cent. had high normal values; 11.5 per cent. had normal values; and 2 cases only showed hypocholesterolaemia—one patient was a man aged 76, the other suffered from an acute empyema of the gall bladder. In both a low value was therefore to be expected.

It is interesting to compare these figures with those obtained in cases of gastric and duodenal ulcer. Twenty-six cases of gastric ulcer were examined; the average cholesterol value was 0.167 per cent.; 27 per cent. of the cases showed hypocholesterolaemia; 50 per cent. gave normal values; and 23 per cent. hypercholesterolaemia. Forty-one cases of duodenal ulcer were examined: the average value was 0.149 per cent.; 36.6 per cent. of the cases showed hypocholesterolaemia; 51.2 per cent. gave normal values; and 12.2 per cent. showed hypercholesterolaemia; and in some of these arterio-sclerosis was noted.

The diagnostic significance of an increased cholesterol content of the blood is therefore important. Over 75 per cent. of patients in whom hypercholesterolaemia was found were suffering from cholelithiasis. The blood examined after operation shows that after all operations of magnitude there is a fall in the cholesterol content. This fall is followed slowly, as a rule, by a rise which may carry the content up to or beyond the normal. A condition of

hypercholesterolaemia may then persist unless measures are taken to reduce the accumulation of cholesterol. To this end a careful supervision of the dietary is necessary. I have followed Chauffard in this matter, and I now give to all patients after operation the following chart.

DIETARY.

This régime seeks to achieve three objects: to avoid any digestive disturbance; to decrease, or at any rate not to increase, the cholesterol content of the blood; and to prevent intestinal infection which might give rise to infection of the biliary tract.

Forbidden.

Fat and eggs.
Stews and fried foods.
Sweetbreads and liver, goose, duck, kidneys, black pudding.
Pork, game, high or spiced dishes, oily fish, soft roe, caviare.
Cooked butter.
Peas, cabbage, raw vegetables.
Strong cheeses.
(Sweets made with eggs may be taken.)

Avoid aerated waters, alcoholic beverages, beer, and liqueurs. Take alkaline drinks and a drink of hot water at the end of each meal.

Frequent small meals, rather than a few heavy meals, should be taken.

Advocated.

Skimmed milk.
Soups made with milk, vegetables, rice, semolina, tapioca.
White meats, lean meats, boiled, grilled, or roasted.
Salt-water fish, containing little fat or oil (for example, sole, whiting, turbot, brill), and river fish, provided they are fresh and not fried.
Cereals.
Potatoes, mashed or in their jackets, turnips, endives, spinach, artichokes, asparagus, vegetables in purées, rice, vermicelli and macaroni.
Mild cheeses.
Fruit—after three months.

The greater frequency of cholelithiasis in women may be in some measure due to their blood condition. Dr. Cecilia Shiskin has found that just preceding and during the first day or two of menstruation the cholesterol content is high (Fig. 2); and that during pregnancy this value steadily augments (Fig. 3) until in the ninth month it is approximately double the normal.

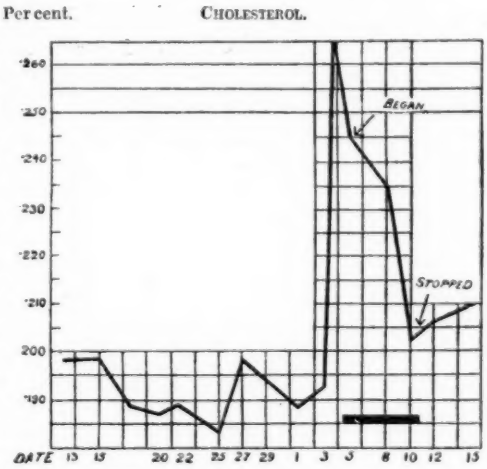

FIG. 2.—Effect of menstruation on cholesterol contents of bloods. (Shiskin.)

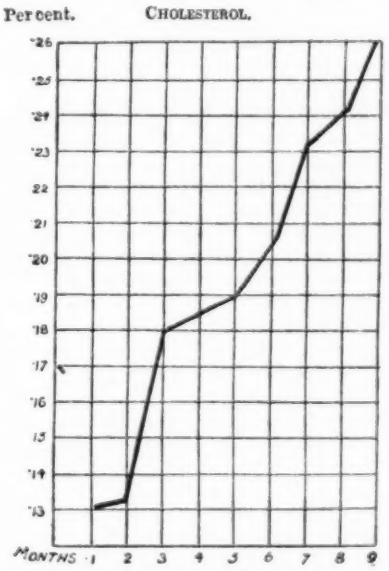

FIG. 3.—Changes in cholesterol contents of blood with the progress of pregnancy. (After Shiskin.)

We did not derive much help in diagnosis from an examination of the stomach contents by the Rehfuss method. Out of 77 cases we found complete achlorhydria in 17, hypochlorhydria in 3, a low normal in 14, a normal in 18, a high normal in 8, and hyperchlorhydria in 17. The "types," of course, were not significant. The only point here which needs comment is that which concerns the rather large proportion of cases in which achlorhydria was present. In all these the administration of dilute hydrochloric acid after operation (30 drops in a tumblerful of water once or twice daily at meal times) is necessary. The rate of emptying the stomach in these cases was: rapid in 27; normal in 34; delayed in 16. The normal period for emptying after the test meal is from one and three-quarters to two and a half hours.

DIAGNOSIS.

The diagnosis of cholelithiasis does not, as a rule, present much difficulty, for the formation of stones in the gall bladder, and those attempts at migration which cause hepatic colic, are terminal events. Cholecystitis precedes cholelithiasis in all cases except those in which the solitary cholesterin stone is present. Our endeavour should be to recognize the presence of the infected gall bladder before the stones have had time to form. The symptoms to which I drew special attention in 1908[1] as "inaugural" are amply sufficient to indicate the existence of cholecystitis. They are symptoms referred by the patient to the stomach. The complaints are of a fullness, weight, distension or oppression in the epigastrium, coming as a rule within half or three-quarters of an hour after meals, relieved by belching, and dismissed almost on the instant by vomiting. These sensations are elicited with remarkable constancy by certain articles of diet, especially those containing greasy or acid material. There is a sensation of tightness, which, if unrelieved, may become acutely painful; by it the patient is made restless, and from it he obtains relief by bending the body forwards, by flexing the right thigh on the abdomen, or by loosening all garments which press upon the waist. There is often a complaint of acidity or heartburn, and in the act of belching there may be bitter and acid regurgitation. Many patients notice that quite suddenly there may be a great gush of saliva into the mouth. While discomforts last there may be a "catch in the breath." When a deep forced breath is taken an acute stabbing pain may be felt on the right side, of such severity that the act of respiration is suddenly checked. Faintness, nausea, sweating of the face and neck, and a sense of great prostration may be followed by vomiting. There may be a slight sensation of chilliness and of shivering, especially in the evenings; "goose-flesh" is mentioned repeatedly in the clinical histories as a very disagreeable experience. Upon all these symptoms, which may exist for years, a series of attacks of colic may be imposed. Our efforts, however, should now be directed to the recognition of the pre-calculous stage of the disease. Recently, with the very skilful co-operation of Dr. L. A. Rowden, this aspect of our work has received close attention.

The radiological evidence of a pathological gall bladder may be direct or indirect. There are times when stones are quite clearly seen in the x-ray photograph, and there are times when the gall bladder shows an opacity greater than that of the stones which lie within it, when what may be called a "negative shadow" is seen. The appearance of the shadows of stones is variable. When the stone consists chiefly of calcium the shadow is very opaque. When the stone is composed largely of cholesterin and a surface deposit only of calcium is present a "new moon" shape, or a "wedding-ring" shape may be recognized in the shadow. Sometimes a mosaic pattern is found, and is due to the overlapping of shadows when stones are superimposed one on another.

The indirect effects produced by disease in the gall bladder are due either to pressure or to traction. A greatly enlarged gall bladder must make room for itself in the abdomen, and it does so by pushing aside the stomach or the duodenum or the colon. The outline of these displaced viscera, when they are filled with an opaque meal, is changed in greater or less degree from the normal. A "half-shadow" is seen in place of the usual shadow. When, on the other hand, the gall bladder after contracting attachments to these viscera begins to shrink it drags them awry

and a conspicuous distortion in their shadows is then seen. A large pouch may form in the duodenum, or the colon be so hitched up to the gall bladder that no effort can displace its shadow.

It may be taken, I believe, as indisputable that a gall bladder which is clearly visible on ordinary radiological examination (apart, that is, from inflation of the peritoneal cavity) is pathological. The following table has been drawn up by Dr. Rowden.

TABLE III.—*Radiological Evidence of a Pathological or Calculous Gall Bladder.*

Direct Evidence.

1. Shadow of stones—
   - Opaque and solid;
   - "New moon" shape;
   - "Wedding-ring" shape;
   - "Mosaic" due to overlapping.
2. Shadow of gall bladder—
   - Every clearly visible gall bladder is pathological.

Indirect Evidence.

1. Pressure effects on—
   - (*a*) Duodenum;
   - (*b*) Pyloric part of stomach (half-shadows).
2. Traction effects—
   - (*a*) Pouching of duodenum;
   - (*b*) Displacements of duodenum;
   - (*c*) Displacements of colon;
   - (*d*) Fixity of duodenum or colon.

It is to be hoped that, by a combination of the several methods of inquiry I have mentioned—inquiry into the clinical history, into the cholesterol content of the blood, and into the radiologist's evidence—an accurate diagnosis of "pre-calculous" cholecystitis may become more frequently possible. When the knowledge gleaned from these sources is correlated with that gained by a chemical and bacterial examination of the gall bladder and its contents, then some clue as to the prevention of cholelithiasis may happily be discovered. I have now had the opportunity of removing a number of gall bladders in what I think may truthfully be called the "pre-calculous" stage; and a number of patients are being treated by large, intermittent doses of urotropine in the hope that they may be enabled to escape the attention of the surgeons.

When stones have formed in the gall bladder the morbid changes are generally extensive and well advanced. It is certain that the walls of the gall bladder are deeply infected, and the muscular layer destroyed; in many cases the infection has spread from the gall bladder to parts around, as is indicated by significant adhesions. Hepatitis in an early or advanced stage is often, though by no means always, present, and the pancreas is not seldom affected. In a large proportion of cases a condition of chronic appendicitis is found, and to all appearance is often of an older date than the disease in the gall bladder. In a small proportion of cases ulceration of the duodenum, or of the stomach, or of both, may be found also. The research work of the surgeon has shown the close affinity, the common causation, or the etiological relationship between these several diseases.

TREATMENT.

When the diagnosis of cholecystitis has been made, or the existence of stones within the gall bladder confidently asserted, the question as to the most appropriate treatment will arise. In the days to which we look forward with hope, and some expectation, it is possible that a recognition of earlier stages in the disease may enable us to prevent, or to delay, those advanced or terminal stages with which our therapeutic activities are now chiefly engaged. By the time that stones have developed, medical treatment can do nothing more than ensure a degree of clinical silence; it does not seem able to retard a steadily progressive pathological change. For the experience is not infrequent which shows that an inhibition of the symptoms of the disease, or more rarely their complete relief, may be witnessed, when in later days it is recognized that morbid processes have been steadily developing in the walls of the gall bladder; and perhaps cancer at last reveals itself.

The conditions which make it necessary to decide against surgical relief must be extremely few. I have often hesitated in days gone by as to whether the condition of a patient's heart would forbid the operation I was otherwise inclined to advise. But, under the tuition of Sir James Mackenzie, before he left Burnley, and after, I learnt that the removal of a diseased gall bladder was in many cases a sure method of giving relief to the heart. Glycosuria is often an effect of cholecystitis, and disappears after an operation which has not been too long delayed. Nephritis, too, need cause no anxiety if deliberate preparation for operation is made to extend over many days. The danger in the operative treatment of cholelithiasis comes from delay, which has led to infection of the ducts, and of the liver, to the "cholecystitic heart," and so forth. Yet the dangers of operation are very small. In the last ten years of my private work, including all cases—malignant cases, cases of stone in the ducts, in the ampulla, in every stage of activity—the gross mortality is 3.1 per cent. Hysterectomy, gastrectomy, colectomy, gastro-enterostomy, and splenectomy are included among the operations performed at the same time as the operation upon the gall bladder or bile ducts. In over half the number of cases the appendix was removed; in many it had been taken at an earlier operation. Some of the cases had been operated upon two, three, four, or more times before I saw them. The mortality is still too high; but it is almost certainly less than the mortality from cancer of the gall bladder alone, in cases not submitted to operation. There is, however, more than the death rate to consider. Operation is not only safer than continued medical treatment, it is also far more merciful. The agonies of hepatic colic are sometimes considerable; they are repeated on occasions which are perhaps very close together; they are sudden and unexpected in their incidence; and no sooner is one attack over than a dread of the next is felt. An operation for cholelithiasis is not always without pain, even when the nerves are blocked with quinine and urea; yet no patient will admit that the pain of the operation is equal to that experienced in one attack of colic. The surgery of cholelithiasis is difficult, sometimes extremely difficult. I hold it to call for greater technical skill, and to present more problems for immediate accuracy of judgement, than any other branch of surgery; and the after-treatment too has its own grave problems.

If I might presume to offer any advice to the surgeon who has no great or continued opportunities for practical work, I would suggest to him never to do gastro-enterostomy in the absence of a demonstrable lesion which requires it; and to leave the surgery of the gall bladder alone. The fact that in my own work nearly one-quarter of the patients suffering from cholelithiasis have been operated upon before is an argument, not against the surgical treatment of the disease, but against an attempt by the inexpert or untrained operator to deal with conditions which may tax all the energies and call out all the reserves of even the most proficient. Surgery is not only a craft, though craftsmanship of a high order is essential. It is a profession to which a man should feel not only complete devotion but also a sense of special dedication. Its practice requires the most flawless integrity in thought and act. It is not lightly to be undertaken by any who have not first surrendered to an iron discipline of training by the masters of their art. No one acquainted with the truth can deny that far too many operations nowadays are done by those who, having perhaps a measure of success in the trivial cases (none are trivial to a patient!), rashly embark upon procedures which they are not fully competent to undertake. And the good repute of surgery is wounded.

CHOLECYSTECTOMY.

In the surgical treatment of cholelithiasis when the stones lie only in the gall bladder, cholecystectomy has displaced cholecystostomy. I feel confident that this decision, which is almost universal, is sound and finds an ample warrant in the bacteriology and morbid anatomy of the gall bladder. The results of drainage of the gall bladder were often good, but they were bad in too large a proportion of cases: for

stones recurred, carcinoma sometimes developed, and the symptoms of an infected gall bladder persisted. Removal of the gall bladder was at first found difficult; the mortality was certainly a little higher, and the complications which ensued, due no doubt to lack of technical experience, were occasionally disastrous. But surgery is growing out of the indiscretions and the sins of its youth. Cholecystectomy rightly performed is as safe as drainage of the gall bladder, and the after-results are far more satisfactory.

The first problem is to decide, in the absence of gall stones, as to those appearances of the gall bladder which justify its removal. What are the signs of a diseased gall bladder? I should say that a gall bladder is infected when it has lost its normal blue colour, or its sheen; when it has lost its suppleness and its walls are thickened by fibrous tissue, or by the deposit of fat, especially along the lines of the vessels; when the cystic gland is definitely enlarged and changed in structure; when adhesions have been contracted to the parts around, especially to the duodenum, or the stomach; or when the cystic duct is thickened and the pelvis of the gall bladder has settled, in a mass of adhesions, firmly down upon the common duct.

In the operation of cholecystectomy there are dangers to be avoided, and there are points to be carefully remembered. The operation begins almost always at the cystic duct. I described this method twenty years ago, and was amused to hear it announced as a novelty, under the title of "retrograde cholecystectomy," just before the war. In this operation, more, I think, than in any other abdominal operation, the exact position and relation of every structure that is encountered must be clearly defined. If the operation begins at the fundus blood trickles down on to the pedicle where the duct and vessels lie; they become stained and difficult to define clearly, and a rash blind clamping of the pedicle may result in almost irreparable disaster. The cystic duct is first clearly defined; it is almost always adherent to, and lies side-by-side with, the common hepatic duct before these join to form the common duct. When the duct is cleared it may be surrounded by a ligature and divided. It must not be cut flush with the common duct, but divided not less than an eighth of an inch away. If cut closer than this to the common duct it is possible that a stricture may form, and be the source of great difficulties. It is no uncommon thing for the cystic duct to be so tightened in elevating the gall bladder that the common duct is dragged upon and is made to look very like the cystic duct. I have operated upon not a few cases in which portions, sometimes even a length of 1½ in., had been cut out of the common duct. It is an elementary principle that the three ducts at their junction shall be clearly demonstrated. The cystic duct being divided, the cystic artery (there may be more than one) is ligatured, an aneurysm needle, or the cholecystectomy forceps, being first passed round it. I have not infrequently seen a broad forceps applied to the artery, which is then severed; this is a dangerous practice. To clamp ducts or vessels when the gall bladder is being forcibly elevated, and then to cut beyond the grip of the forceps, is a clumsy and perilous method of work. A ligature should be passed round every structure to be severed, and pains taken to make it indubitably certain that nothing but the duct or vessel is embraced. This no doubt sounds very elementary advice; but many patients would have been saved if only it had been understood and observed.

In my gall-bladder operations I was formerly much impressed by two events. Occasionally I would have a long struggle for the life of a patient, or even lose a patient, when I had expected an easy and untroubled convalescence. And occasionally I would find, on visiting a patient in the evening after the operation of cholecystectomy had been performed, that the dressings were saturated with bile. During operations I was struck by the irregular arrangement of vessels, and by the occasional discovery of an anomaly in the ducts. I therefore suggested to my colleague Mr. E. R. Flint that he should examine a series of bodies and endeavour to discover the variations—which were apparently not very infrequent—in the anatomy of the parts concerned in the operation of cholecystectomy. His work[2] has made matters plain. It is quite evident that unless unremitting care is exercised it is easily possible to ligature the right hepatic artery instead of the cystic artery. A "cystic artery" that appears larger than normal, or has a "hump" in it, is often the right hepatic artery! Ligature of the right hepatic artery in a patient whose liver cells are already damaged as a result of an infection which is a part of his disease may be a serious or even fatal matter; and an accessory right hepatic duct is present in not less than 15 per cent. of cases. However watchful one may be, the wounding or the division of an accessory right hepatic duct may occur. If this should happen it is hardly worth while to repair the duct, or to anastomose its cut end with the divided cystic duct. But it is essential that a drainage tube should be left in the wound. I have closed the abdomen without drainage after removal of the gall bladder on many occasions; but I never do so now. A small tube does no harm: it leaves no gap in the abdominal wall if the rectus muscle is displaced outwards, and it gives a measure of safety obtainable in no other way.

Many of the patients who must submit to operation for cholelithiasis have been martyrs to their disease for long periods. Stones may have escaped into the common duct, or have passed upwards into the hepatic ducts, and biliary cirrhosis may have developed. The functional activity of the hepatic cells may be greatly impaired. A recognition of this truth must guide every stage in the care of the patient. In the day or two preceding operation as much glucose as possible should be given. During the operation the liver cell must not be made to suffer the burden which chloroform, a deadly drug, imposes upon it. The anaesthesia should, as far as possible, be induced and maintained by gas and oxygen. Hepatic insufficiency and acidosis are difficult conditions to master. Of the former we now recognize two types. There is one in which the amount of bile discharged ceases or is greatly reduced; jaundice deepens ominously; the mind becomes obtuse; vomiting develops; the pulse becomes slower, the patient more and more enfeebled; drowsiness precedes coma, and the blood urea steadily increases; renal failure, consecutive to hepatic failure, is then the cause of death. And there is another in which, after a normal course of from three to eight days, the bile discharged becomes copious, thin, and pale; jaundice does not change perceptibly; restlessness, great prostration, profound muscular weakness, and a peevish irritability are noticed; vomiting is present but is not as a rule severe; blood urea remains low; failure of the liver function is the cause of death.

Another menace, happily infrequent after operation upon the gall bladder or the ducts, is acidosis. Of this one seems to learn little from the textbooks on physiology; yet there are few conditions more necessary for the surgeon to understand.

Acidosis.

(A) Acidosis or ketosis is a condition in which certain acids gain access to the blood and therein threaten to diminish the alkali reserve in consequence of the very urgent necessity that they should be neutralized. The neutralization in the blood is effected chiefly by sodium bicarbonate. As this is accomplished the carbonic acid, whose ratio to $NaHCO_3$ is constant, would be in excess but for the controlling mechanism which preserves the reaction of the blood at its normal level. Acidosis may therefore be considered as a condition brought about by the excessive withdrawal of bases in consequence of the formation of acids within the body. It is that state of metabolism of which the most constant characteristic is the production in abnormal quantities of "acetone" bodies (hydroxybutyric acid, diacetic acid, and acetone). Even in the most severe degree of acidosis only the slightest alteration in the reaction of the blood is perceptible. The steady maintenance of the normal reaction depends on the presence of certain alkaline salts—the "buffer salts"—of which the chief is sodium bicarbonate, $NaHCO_3$.

For a stable blood reaction the ratio between the CO_2 and the $NaHCO_3$ is maintained at a constant value. When acids are added to the blood they react with the buffer salts, forming sodium salts of the respective acids, and these are excreted in the urine. If, therefore, large amounts of acids are continually poured into the blood, the buffer salts may decrease to a degree which renders it beyond the power of the body to replace them. Their concentration in the blood is therefore reduced below the normal, and, the ratio between CO_2 and $NaHCO_3$ being kept constant, the carrying capacity of the blood for CO_2 is also reduced, and accordingly CO_2 may accumulate in the tissues. The blood under such conditions will, of course, cause stimulation of the respiratory centre; a more thorough ventilation of the lungs and of the

blood then results in an urgent attempt to prevent further accumulations of CO_2 in the tissues. This hyperpnoea is one of the clinical symptoms of acidosis.

(B) The acids which gain access to the blood are intermediate products in fat katabolism.

(C) The imperfect combustion of fats is associated with, and is perhaps due to the absence, or diminution, of, that product of carbohydrate metabolism which sets alight this combustion.

(D) A primary deficiency in carbohydrates is therefore an essential preliminary fault in cases of acidosis.

(E) This deficiency may be due to an insufficient supply of carbohydrates to the body, such as occurs in cases of, say, pyloric obstruction with copious vomiting, or to an imperfect metabolism of carbohydrates of which there is no lack. The anaesthetic chloroform probably interferes with carbohydrate metabolism by its direct action upon the liver cell.

(F) In cases of carbohydrate deprivation the deficiency may be at once made good by the administration of glucose. This cannot be given in adequate quantities by the mouth to patients afflicted with acidosis, on account of the vomiting which is so persistent. If administered by the rectum its absorption, when considered in relation to the urgency of the patient's need, may appear slow. If it is given subcutaneously the quantity taken up is small, owing to the enfeebled systemic and lymphatic circulations. When administered intravenously there is no reasonable limit set to the amount which can be given. Either a 5 or a 10 per cent. solution may be injected; an isotonic solution contains 4.15 per cent. of glucose. Matas of New Orleans, a surgeon to whom our debt of gratitude is very heavy, was the first to suggest (in 1911) that glucose might be given by continuous instillation. He has recently[3] described an apparatus which renders easy the "continuous drip" intravenous administration of a glucose solution maintained at an equable temperature. About 8 pints may be introduced in the period of twenty-four hours; I have once introduced as much as 18 pints. A reaction is seen not infrequently—the patient shivers and then sweats, a miniature rigor occurring; no anxiety need be felt on this account. The cause of the reaction is doubtful; it may perhaps be the too rapid administration of the fluid.

(G) The mere accumulation of glucose within the blood is not, however, all that is necessary. The glucose must be utilized by the tissues. We owe to Thalhimer of Milwaukee[4] the supremely important suggestion that this may be done by the injection of insulin.

My experience of the method is small, but it is enough to say that a new remedy of considerable importance is now at our disposal. Insulin must not be injected until there is a good store of glucose in the blood lest a hypoglycaemic reaction be caused; not less than 15 ounces of a 5 per cent. solution should have passed into the vein, and unless there is great urgency it is well to introduce an even larger amount, or to have a stronger solution. Lilian Farrar[5] has used a 20 per cent. solution for intravenous administration. As she points out, glucose is not only a food and source of energy, but also a stimulant to the tissue cells and to metabolism; the liver function is conserved by it and the glycogen store increased.

Fisher and Snell[6] record cases illustrating the value of the insulin treatment in pre-operative and post-operative non-diabetic acidosis.

Vomiting is often the warning symptom of impending acidosis. It is present along with great prostration and a considerable degree of air hunger, and with a sweet "new-mown hay" smell in the breath. The urine gives the characteristic reactions for acetone and diacetic acid.

Lavage of the stomach is the sovereign remedy for relief of the vomiting, which is most distressing. But in acidosis, as in cases of obstruction, or of adynamic distension of the stomach and duodenum, the lavage may need to be repeated so frequently as to be a tax upon the surgeon and a sore trial to the patient. Happily a most excellent method of lavage is made possible by the Jutte tube, or the Levin tube—tubes of about the same size as the Rehfuss tube. If passed through the nostril they may remain for hours without distress to the patient, who may then drink fluids freely.

I have, I fear, wandered discursively over a large field in dealing with the subject of cholelithiasis. There are so many problems that confront us as we cope with this very formidable disorder that it is not easy to choose among them. There is so much still to learn. The relationship of the liver to the spleen, of both to the pancreas, and of all three to the reticulo-endothelial system, and the effect which injury to the liver cell has upon the kidneys, are matters calling for fullest inquiry. Though we seem to know so little of any of these organs, and still less of their interplay, the work of the surgeon which has so marvellously contributed to our clinical knowledge may still hope to prove not unworthy of regard as one of the most fertile of all methods of research.

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Lectures
ON
THE SYMPATHETIC INNERVATION OF STRIATED MUSCLE.*

BY

THE LATE JOHN IRVINE HUNTER, M.D., CH.M.,
CHALLIS PROFESSOR OF ANATOMY IN THE UNIVERSITY OF SYDNEY.

LECTURE III.—PART II.

THE PRACTICAL APPLICATIONS (*continued*).

THE CONTROL OF TONE BY THE BRAIN.

THE SELECTION OF PATIENTS FOR RAMISECTION.

I SHALL now consider the reflex arcs concerned in maintaining the two elements of tone, and the scientific principles for the selection of patients for ramisection.

Plastic tone is enhanced in degree in the decerebrate animal. It may appear as a component of postural contraction immediately after the mid-brain is cut across, so that, normally, prespinal pathways are employed by the impulses maintaining it. When decerebration is performed, plastic tone is increased in degree as a result of the release of this prespinal sympathetic reflex arc from higher levels of control. In addition to this, contractile tone is enhanced in value because of the release of a somatic prespinal reflex arc. In animals recently decerebrated this increase of contractile tone selects the antigravity muscles, and their antagonists are reflexly inhibited. The increase in plastic tone rigidly maintains the extended posture, which is endowed by contractile tone upon all four limbs of the quadruped, and maintains the condition of "reflex standing" for long periods of time. When the relaxation from the posture of extension occurs, plastic tone still remains, as is proved by the presence of "lengthening and shortening reactions."

The prespinal reflex arcs subserve the two components of tone of the normal skeletal muscle, and overactivity of these arcs accounts for the phenomena exhibited by the muscle in decerebrate rigidity. It was shown by Sherrington that cutting across the medulla oblongata led to flaccid paralysis of the limbs. More precisely, as Magnus has shown, the limits within which section of the brain stem produces decerebrate rigidity are as follows: The cranial limit is a plane passing dorsally at the level of the caudal limit of the superior colliculus and ventrally in the region immediately caudal to the mammillary bodies. The decerebrate rigidity persists until the level of entrance of the eighth nerve is passed. Obviously, therefore, the nuclei that constitute the cell stations of the prespinal reflexes responsible for decerebrate rigidity lie within these limits.

The work of Thiele in 1905, which is supported by the recent results of Bazett and Penfield,[22] indicates that the integrity of the lateral vestibular nucleus of Deiters is essential for the development of decerebrate rigidity. It may be concluded that this nucleus takes part in the completion of one of the reflex arcs, the hyperactivity of which is responsible for decerebrate rigidity. The vestibulo-spinal tract (Fig. 13), which lies in the region of the emerging motor root fibres of the spinal cord mainly on the same side as the nucleus from which it originates, constitutes the descending limb of the reflex arc.

The nucleus of Deiters is a special afferent somatic nucleus, and the reflex arc in which it is incorporated constitutes, therefore, the somatic prespinal reflex pathway. It subserves contractile tone, which has a selective incidence upon antigravity muscles maintaining the body erect.

The question arises whether the nerve cells incorporated in the sympathetic prespinal reflex arc can also be identified. The levels between which section of the brain stem produces decerebrate rigidity suggest that the formatio reticularis of the pons supplies the cell station of this arc. The reticulo-spinal tracts of the pons are anatomically of special

* Delivered by Professor Elliot Smith at University College, February 2nd, 1925.

importance. Collier and Buzzard have termed them the ponto-spinal tracts. The anterior ponto-spinal tract, which is uncrossed, descends in the lateral zone of the medulla oblongata and the anterior funiculus of the spinal cord. The lateral ponto-spinal tract crosses to the opposite side and lies in the lateral zone of the medulla oblongata and in the lateral funiculus of the spinal cord.

Sherrington's experimental results are compatible with the view that the vestibulo-spinal and ponto-spinal tracts convey impulses to the spinal cord that are responsible for decerebrate rigidity. Section of the lateral half of the bulb abolishes the rigidity on the same side as the lesion. Section of one ventro-lateral column of the spinal cord in the cervical region destroys the rigidity in fore and hind limbs of the same side, while section of one lateral column in the upper lumbar region abolishes the rigidity in the hind limb of the same side as the section. The ascending limbs of these arcs are also in the antero-lateral funiculus: for section of the posterior funiculus does not abolish decerebrate rigidity.

In an experiment to study this point I have found that plastic tone does not disappear after removal of the nucleus of Deiters. First, decerebrate rigidity was produced by cutting across the mid-brain between the superior and inferior colliculi. Extensor rigidity developed rapidly and well. Now, in a phase of relaxation, when plastic tone was well shown in the right hind limb, I isolated the region of the lateral angle of the fourth ventricle on the right side by a crescentic incision, removing Deiters's nucleus and severing the vestibulo-spinal tract by this procedure. But the "lengthening and shortening reactions" were still exhibited. A second section at the junction of the pons and medulla was then made. The limbs became flaccid immediately. The "lengthening and shortening reactions" were no longer to be elicited. Obviously plastic tone depends upon a reflex arc that attains a level between the mesencephalon cranially and the medulla oblongata caudally. This is compatible with the view that the ponto-spinal tracts subserve the function of plastic tone.

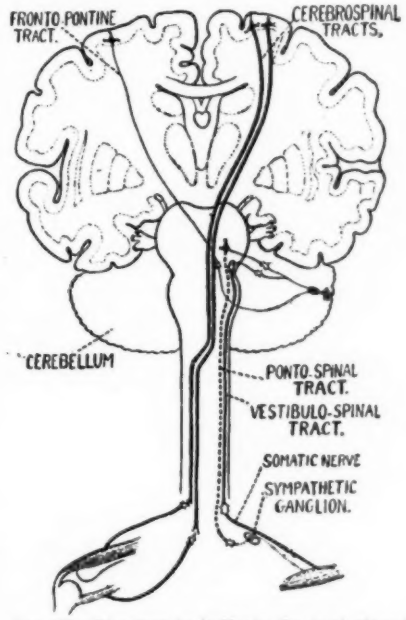

FIG. 13.—Diagram to indicate the part played by the vestibulo-spinal tract (arising from Deiters's nucleus) and the ponto-spinal tract (arising from the reticular nucleus of the pons) in the two reflex arcs concerned respectively with contractile and plastic tone.

It is possible for an incomplete lesion of the spinal cord to affect the pyramidal and concomitant descending tracts, so releasing the primary spinal arc from control, without affecting in any considerable measure the vestibulo-spinal and ponto-spinal tracts. Riddoch and Buzzard[23] have recently described cases of quadriplegia from high cervical lesions of the spinal cord, in which the distinctive qualities of decerebrate rigidity were reproduced. Riddoch reports that *post-mortem* examination of one of these patients revealed a tumour in the region of the posterior and lateral columns of the fourth and fifth cervical segments of the spinal cord. The ventral portion of the cord was relatively little affected.

It is clearly to be borne in mind that the extensor posture is a relatively unimportant character in establishing an analogy between the condition of spastic paralysis in man and decerebrate rigidity experimentally produced. The posture assumed is due to the selective incidence of contractile tone upon the skeletal musculature. Riddoch and Buzzard recorded that, in their patients, the position of flexion was sometimes encountered. On these occasions the flexors were more spastic than the extensors. This condition could sometimes be induced by holding the limbs in the flexed position for a short time. Further, McAlpine reported a case in which rigidity was not confined to extensor muscles, and flexor rigidity of the knee-joint was sometimes obtained.

Graham Brown has demonstrated beyond all doubt that plastic flexor tone may be exhibited in the limbs of the monkey. These observations are of added significance in the light of Bazett and Penfield's work on chronic decerebrate rigidity. These authors describe two kinds of decerebrate rigidity—extensor and flexor. Their observations prove that the somatic reflex arcs producing contractile tone may selectively act upon either the extensor or flexor muscles. In extensor rigidity the reflex, of which the vestibulo-spinal tract is the descending limb, is involved. In flexor decerebrate rigidity the primary spinal reflex is, no doubt, responsible for the activity, for severe injury to the spinal medulla produces paraplegia in flexion. In both types of decerebrate rigidity plastic tone, which is enhanced in degree, and coexists with contractile tone, is maintained by the sympathetic prespinal reflex arc. In each case it is inhibited in the antagonists of the muscles exhibiting the rigidity.

Inhibition in the antagonists is not so complete in man as it is in the condition of acute decerebrate rigidity in animals. Dr. Royle has called attention to this point. Riddoch mentions the fact that though the antagonistic muscles are relatively relaxed "they are certainly in stronger contraction than the corresponding muscles of a healthy individual."

I believe the explanation of this is that in an animal that has recently been decerebrated the extensor reflex arcs, chiefly through the nucleus of Deiters, immediately manifest increased activity. The isolated flexor spinal arcs regain activity only after a period of inactivity. When this occurs the selective action of contractile tone on the extensors is not so complete, for the spinal arc endows this aspect of tone upon the flexors also. Reflex inhibition is now not complete. Bazett and Penfield's experiences with the chronic decerebrate animal support this view. Moreover, in patients suffering from spastic paralysis, plastic tone is not inhibited in antagonistic muscle groups; which accounts, in some measure, for resistance to active, reflex, or passive movement of the limb.

I have commented on the work of Bazett and Penfield to emphasize the fact that the posture of the patient is not the all-important criterion of rigidity. Even the flexed position may be due to a combination of both contractile and plastic tone which together cause rigidity in the sense in which this term is employed in this lecture. Conversely, the extensor position may be wholly due to contractile tone. Sympathetic ramisection in such a case would be of no avail. Extensor fits usually fall into this category. This is beautifully illustrated in a case recently reported by Walshe,[24] in which two stages of the illness were observed. In the first stage the patient exhibited a condition of decerebrate rigidity. The limbs were extremely "plastic" and tended to remain for a considerable time in any position passively imposed upon them. The lower extremities were extended and adducted and the feet plantar-flexed. As is usual in man the upper extremities were semiflexed at the elbows, with the forearms pronated and the wrists and digits flexed. This attitude often replaces that of extension of the fore limbs of quadrupeds because the upper extremities are no longer "simple locomotor props." Passive movement revealed the presence of the "clasp-knife" character of the spasticity. The tendon-jerks exhibited tonic prolongation, and in some instances in response to repeated taps "step-ladder" shortening of the muscle was observed. In recording these features, Walshe established beyond doubt the identity of this condition with decerebrate rigidity experimentally produced.

In the second phase of the illness this condition was replaced by the progressive failure of reflex activity and deepening coma. In this stage tonic fits appeared as a con-

comitant of cardiac and respiratory irregularities. In these fits the respiratory muscles were fixed and the limbs became so rigid in their customary posture that no tendon reflexes could be elicited. In severe fits of this kind the head retracted forcibly. At this stage none of the essential qualities of decerebrate rigidity, enumerated as characterizing the first phase of the illness, were exhibited, for plastic tone was not apparently enhanced in degree. The second phase was in all probability due to hyperexcitability of the somatic reflex pathways due to asphyxia or anaemia (cf. Walshe, Stewart and Pike, Warner and Olmsted, Hunter and Royle). The fits are not comparable to decerebrate rigidity in which the enhanced tone is due to release in function of two prespinal reflex arcs—somatic and sympathetic. Yet the posture displayed in each condition is the same. Taking into account the results of tests for the presence of plastic tone in addition to posture Walshe and Riddoch have been able to establish the essential identity of decerebrate rigidity and the condition of spastic paralysis, such as that which occurs in hemiplegia, quadriplegia, and the extended form of spastic paraplegia.

The only patients who can be expected to benefit from the operation of ramisection are those whose voluntary control of their muscles is intact, but whose movement is hampered by excessive plastic tone. By cutting the sympathetic nerves plastic tone is eliminated and the limbs freed from the spasticity. *The presence of "lengthening and shortening reactions" is an indication for the operation of sympathetic ramisection for the relief of spastic paraplegia. Slowness in execution of the tendon reflexes is an important indication for the operation.*

Conversely, rapidly executed reflex movements usually constitute a definite contraindication. The greater number of spinal injuries are accompanied by this type of reflex and plastic tone is at a minimum. This is due to the fact that a prespinal reflex is essential in higher forms for the maintenance of this property of muscle, and usually, though not always, as will be proved subsequently, this reflex is rendered inactive when the spinal cord is injured.

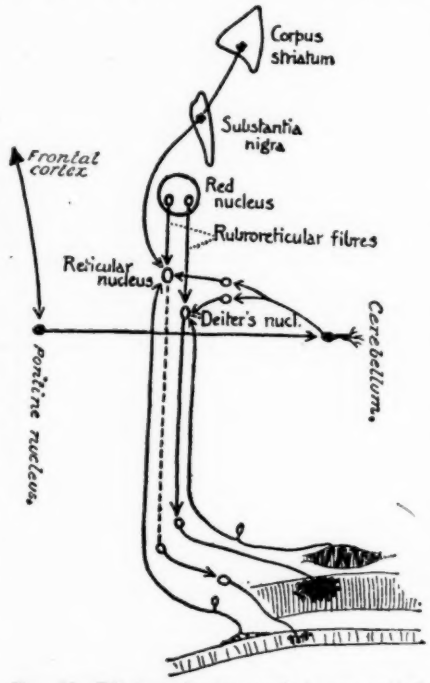

FIG. 14.—Diagram to represent in an entirely tentative way the influence of the cerebral cortex (acting via the cerebellum), corpus striatum, substantia nigra, and red nucleus upon the activity of Deiters's and the reticular nuclei. Only those tracts which are mentioned in the text have been represented. The relays in the ascending spinal tracts have not been indicated.

HIGHER LEVELS OF THE BRAIN CONTROLLING THE TONIC REFLEX ARCS.

Magnus has shown that in animals, such as the rabbit, cat, dog, and monkey, the whole of the cerebral hemispheres, including the corpora striata, may be removed and the tone of skeletal muscle remain of normal intensity. Nor is the tone altered when the brain stem is cut across behind the thalamus. Such a "mid-brain" animal, unlike the decerebrate preparation, is capable of a great variety of reflex activities—as walking, running, and jumping. It can right itself if overturned, the head at once resuming its normal posture. These are the "postural reflexes" of Magnus. Obviously, therefore, in these animals, the mid-brain provides an important part of the nervous mechanism utilized in the regulation of posture. It is when this region is taken away that release of the prespinal reflex arcs takes place to produce decerebrate rigidity. For instance, in higher forms, at least, as Magnus's observations upon the monkey reveal, the connexions of the visual pathway with the mid-brain play an important part in the nervous regulation of posture. Tecto-bulbar connexions therefore control the prespinal reflex arcs in these forms. Moreover, decerebrate rigidity develops after the removal of the red nuclei, and, as Walshe mentions, "it seems as though removal of the greater part of the red nucleus is an essential preliminary to the development of rigidity." In this process rubro-reticular fibres, which in man have attained special importance, are severed. The cells of the substantia nigra are also known to send axones to the tegmental region of the brain stem.

In view of prevailing conceptions it is noteworthy that in the animals described by Magnus the postural reactions are carried out by the mid-brain in the absence of the corpus striatum. It would, however, be unwise to argue that in man the mid-brain structures exhibit this independence of the corpus striatum, for the principle of the shifting forward of function in the nervous system must not be lost to sight in this connexion. Moreover, it may well be that the physiological value of the corpus striatum is only adequately expressed in the presence of voluntary activity. In such a case the symptomatology of lesions of the corpus striatum, with the cerebral cortex intact, will be different from the experimental results of complete removal of both the cerebral cortex and corpus striatum.

For these reasons the observations of Magnus that "thalamus" and "mid-brain animals" exhibit tone of normal intensity and distribution cannot unreservedly be applied to man. It is possible that the corpus striatum in man, with the cortex intact, controls through the intermediation of subpallidal nuclei, as the substantia nigra, the sympathetic prespinal arc subserving plastic tone. To study this point I have removed the corpus striatum on one side in birds, employing the domestic fowl and the sea-gull for this purpose. Birds represent a group widely divergent from mammals. In birds the corpus striatum has attained a relatively enormous importance, both structurally and functionally, and in certain respects its influence may present a closer analogy to that of man than is the case in most mammals. The operation is easily performed on birds because the corpus striatum constitutes, except for the septum and a small superficial area of cortex, the entire cerebral hemisphere. Further, in removing the corpus striatum, which is readily accessible because it forms the greater part of the surface of the hemisphere, the cerebral cortex may be lifted up and left in communication with the septum. In this way the tractus cortico-septo-mesencephalicus is left intact.

This operation produces rigidity of all the limbs. Standing is not evenly maintained owing to rigidity of the hind limbs. On this account in seagulls a tendency to rise on the toes is constantly exhibited and the bird does not maintain any given position for long. Birds in this condition often squat down, presumably to avoid balancing on the rigid limbs. The wings are also rigid, and here the nature of the rigidity may readily be studied. The wings are sometimes maintained in a position somewhat higher than usual, so that the adjacent borders are almost in contact with one another. The rigidity maintains its intensity during passive movement, and on account of its rigidity the wing remains fixed in the new position assumed. This occurs even though the position be so abnormal, as when the wing is folded over the mid-line of the back, that the fibrous structures contained within are put upon the stretch. Dependent positions are maintained equally well. Both wings exhibit this phenomenon after the unilateral operation, but the rigidity is greater on the same side as the injury. The rigidity is responsible for slowness of movement, especially on the same side. This is readily seen on watching the movements of the wing during attempted flight while the bird is held captive in the hand. A greater effort is necessary to carry the wing through a smaller range of upward movement than on the less affected side; increased effort marks downward movement also, and the wing seems to overshoot the position at which it normally

ends. These alterations in the nature of the movement of the wings are greater on the side of the injury, so that the flight of such a bird, when released, is always in a circle, the bird tending to fly toward the more affected side.

This diffuse muscular rigidity is strongly reminiscent in an exaggerated form of the condition of the wing already described, in which, after the removal of contractile tone, plastic tone is accessible for independent study. I cannot avoid the deduction that increased plastic tone in both flexor and extensor muscles of the wing is responsible for the diffuse muscular rigidity which follows the removal of the corpus striatum in birds. This element of tone is so enormously increased that manifestations of the presence of the contractile component are in the background.

The condition of rigidity of the wing of birds above described is remarkably similar to Parkinsonian rigidity in man. Its diffuseness, resistance to stretching, and the tendency for fixation of the muscle at any length passively imposed upon it, are common to the two conditions; and in both conditions poverty and slowness of voluntary movement, which are probably due in part to the underlying phenomenon of rigidity, are notable concomitants.

Removal of the influence of the sympathetic innervation by section of the cervical sympathetic trunk caudal to the brachial plexus abolishes the rigidity of the wing. This property, like normal plastic tone, is subserved therefore by the sympathetic system. It is difficult to escape the conclusion that the basis of the rigidity following lesions of the corpus striatum is increased plastic tone, which is exhibited in all muscle groups, and that this is due to removal of control from the sympathetic prespinal reflex arc which maintains the plastic tone of normal skeletal muscle.

The different manifestations of excess of plastic tone in those cases of spastic paralysis which resemble experimental decerebrate rigidity, and in the condition of Parkinsonian rigidity, are capable of reconciliation. The fundamental difference between the two conditions is that, while plastic tone is increased in both, an excess of contractile tone is also exhibited in spastic paralysis, while it is not greatly in evidence in Parkinsonian rigidity. Contractile tone is selective in its incidence, and the plastic tone of the antagonists of the muscles selected by it is, to a very varying degree, reciprocally inhibited. In Parkinsonian rigidity this selective incidence upon muscles, and consequently the selective inhibition of plastic tone in the antagonists, are absent. In spastic paralysis resistance to passive movement is considerable till the position imposed upon the limb by contractile tone is overcome, when the resistance becomes less. A combination of contractile and plastic tone is responsible for the initial position in spastic paralysis. The posture assumed in Parkinsonian rigidity is due to plastic tone only exhibited in agonists and antagonists, and therefore resistance to passive movement is the same throughout the whole range of movement. The fact that postural reactions and intercurrent reflex movements are not exhibited in Parkinsonian rigidity as in spastic paralysis is a further indication that somatic activities, which include contractile tone, are in abeyance in this condition. The mechanism which inhibits plastic tone in order that a movement may be performed or to allow a new posture to be assumed is no longer active. This effect is probably the cause and not the result of the rigidity—that is to say, a predominant function of the corpus striatum is to regulate plastic tone. From a consideration of the other effects of corpus striatum lesions it seems that this regulation is especially in the interests of automatic and associated movements, and of emotional expression. These functions are no doubt impaired by the lesion; the rigidity itself may limit these activities still further.

It remains to be proved that the rigidity of paralysis agitans and allied conditions is subserved by a proprioceptive mechanism in order to establish completely the identity of the tendency in this condition to fixation of the muscle at any length imposed upon it, with the "lengthening and shortening reactions."

In the first place it must be borne in mind that the sympathetic reflex arc subserving plastic tone is not necessarily at the same level as the somatic connexions. Therefore, in posterior root section, contractile tone may be affected without removing plastic tone.

Surgical operations upon the posterior nerve roots have necessarily been less complete than is possible under experimental conditions.

Leriche's cases, in which posterior root section was performed for the relief of paralysis agitans, are evidence of this. In one case the fifth, sixth, and eighth cervical posterior nerve roots were divided. In this case the rigidity was undiminished. Obviously, however, the sympathetic afferent connexions of the skeletal muscle of the limb were left intact by this operation because the posterior root of the first thoracic nerve was not attacked. Therefore this case does not disprove that rigidity is maintained by a proprioceptive mechanism. The first principle of posterior root section in man should be to include the posterior root of the first thoracic nerve in the case of the upper limbs, and of the first or second lumbar nerve in the operation for the lower extremities.

However, Walshe has recently brought forward strong evidence that the rigidity of paralysis agitans is due to the activity of a proprioceptive reflex mechanism. He has shown that injection of 1 per cent. novocain into the muscle at its motor point causes rigidity to disappear. While admitting the possibility that this effect may be due to direct action upon the muscle, he shows convincingly that the balance of evidence is in favour of the view that the afferent nerve terminations are affected.

Walshe's investigations upon the rigidity of paralysis agitans beautifully illustrate the fact that the tremor exhibited in this condition and the rigidity are subserved by two different nervous mechanisms. For although novocain abolishes rigidity the tremor is totally unaffected. The indications are that impulses through the cerebrospinal tracts are involved in the production of spontaneous tremor, for it disappears after hemiplegia. This is in accord with the results of sympathetic ramisection in this condition. The rigidity is markedly diminished, voluntary power is increased, and movements are more ample and rapid, but the tremor is not appreciably affected when well established. But a patient with Parkinsonian rigidity without tremor, as for instance as a sequela of encephalitis lethargica, may derive sufficient benefit to justify the operation.

In a recent paper McAlpine[25] has described a patient who, as a sequela of epidemic encephalitis, developed Parkinsonian rigidity on the right side and a condition strongly resembling decerebrate rigidity on the left side. According to views advanced here, the diffuse muscular rigidity on one side was due to a generalized increase of plastic tone, lack of selective incidence being due to the absence of increase in contractile tone. The rigidity on the other side, however, was sometimes flexor and sometimes extensor. Therefore contractile tone was present and acted selectively on different groups of muscle at different times. Plastic tone was also enhanced in the upper and lower limbs of this side. It was exhibited by the presence of the "lengthening and shortening reactions." It was shown to the greater extent in the flexor and extensor muscles at any particular time according to the selective incidence of the contractile tone at the time. In the erect posture tone predominated in the extensor muscles of these limbs. Since the tone responsible for this decerebrate attitude consists of the two normal components of tone, the term "plastic tone" alone is clearly inadequate to describe the condition. Sherrington's term "postural tone" may be used for this purpose. Contractile tone reflexly imposes the position upon the body and plastic tone maintains this position once it is assumed. On passive movement the characteristic "lengthening and shortening reactions" indicating the presence of plastic tone are elicited.

In a natural attitude such as standing contractile tone is responsible for selective action upon the antigravity muscles and plastic tone fixes the length of the muscle fibres necessary to maintain this position. To accomplish voluntary movement from this position the prespinal reflex arcs responsible for postural tone must be controlled by the cerebral cortex. Evidence is accumulating that the cerebral cortex not only causes contraction of the appro-

priate muscle groups by way of the cerebro-spinal tracts, but inhibits the reflexes responsible for postural contraction. It effects this purpose through the intermediation of the cerebellum (Figs. 13 and 14).

An inhibitory pathway leads from the cerebral cortex to the anterior part of the superior vermis of the cerebellum through the medial part of the crus cerebri and the pontine fibres. Stimulation of the crus in a decerebrate cat leads to complete rigidity in the limbs of the same side and diminution of rigidity in those of the other side. Warner and Olmsted[26] have traced the origin of this inhibitory tract to the frontal region of the cerebral cortex. When the motor area was cut away no increase of extensor tone was observed on either side of the body. Definite rigidity developed at once in the opposite fore and hind limbs when the frontal area was removed. This observation is of great significance in view of the fact that, in man, pure cortical lesions of the pyramidal tracts do not produce spasticity. On the other hand, lesions of the area of the frontal lobe from which the fronto-pontine tracts originate (Campbell) are associated with a condition of "tonic innervation" expressed as inability to relax a contracted muscle group.

Warner and Olmsted have elucidated the course of this tract arising in the frontal region by studying the inhibition of rigidity obtained by electrical stimulation of the cut surface of the brain in various situations. They found that the inhibitory effect of the tract is bilateral, but predominantly on the crossed side. The tract passes from the frontal lobe through the medial part of the internal capsule. Below the level of the superior colliculi it crosses, in greater part at least, to the other side of the brain stem. It continues to the cerebellum by way of the middle cerebellar peduncle. The inhibitory tract is therefore fronto-ponto-cerebellar in its connexions. (See Figs. 13 and 14.)

Warner and Olmsted state that when this tract is stimulated a limb exhibiting extensor rigidity goes "limp and flaccid." Miller and Banting describe the effect of stimulation of the anterior surface of the cerebellar vermis as being "immediate and general relaxation of the rigidity." Obviously the inhibition affects both contractile and plastic components of tone which are enhanced in degree to produce decerebrate rigidity. The fronto-ponto-cerebellar tract, therefore, inhibits the effect produced by the somatic vestibulo-spinal and sympathetic ponto-spinal tracts. When this tract is ineffective the power to relax the muscles after being employed in muscular effort is defective. In the absence of a case purely of this nature in Dr. Royle's series it is interesting to note that the effect of sympathetic ramisection improves the power of relaxation of contracted muscles in spastic paralysis. It is to this fact that the increased control and rapidity of effecting voluntary movement are due. The patient need no longer inhibit plastic tone. His cortical control is mainly concentrated on executing movement.

It is worthy of note that tumours of the middle lobe of the cerebellum give rise to fits of a tonic character in which the extensor attitude of decerebrate rigidity is assumed (cf. Hughlings Jackson). Sherrington found that a rigidity somewhat similar to that ensuing on removal of the cerebral hemisphere set in after median section or ablation of the cerebellum. He was not convinced that the two conditions were identical. Thiele,[27] however, regarded the bilateral rigidity which followed removal or bisection of the vermis as being like decerebrate rigidity. He explained it as being due to loss of the inhibitory control of the vermis over the nucleus of Deiters. No doubt also the ponto-spinal tracts are released from control. It will readily be seen that the only effect of sympathetic ramisection upon tonic extensor fits following interference with the fronto-ponto-cerebellar pathway is to diminish the degree of rigidity during the extensor spasms. Since contractile tone remains practically unaffected after this operation the extensor attitude will still be assumed. This is another instance of posture alone not being an indication for ramisection.

The fact that the cerebral cortex employs the cerebellum as an intermediate organ through which it exerts an inhibitory influence over the postural reflex arcs of the brain stem is of great general significance. It confirms the suggestion of Walshe that "the cerebellum is the organ through which the cerebral motor cortex influences postural activities and regulates posture in the interests of co-ordinated purposive movement." "It may be," he proceeds, "the subordinate mechanism employed by the cerebral cortex in the refined correlation of posture and movement." This view indicates that the cerebellum is employed by the cortex in the performance of active movements also. It reinforces postural tone in order to maintain the attitude of the body assumed during the performance of the movement initiated and executed by motor impulses which have their origin in the cerebral cortex.

In 1900, discussing the significance of the cerebro-cerebellar pathway which passes through the brachium pontis, Sherrington said: "Thus one and the same cerebral discharge may perhaps pour upon the motor root nerve cells a combination of cerebral and cerebellar impulses." It is on account of the influence of the cerebral cortex in the regulation of posture through the intermediation of the cerebellum that lesions of the cerebellar hemisphere cause inco-ordination of voluntary movements.

When a voluntary movement is completed cortical impulses reinforce contractile tone to determine the attitude assumed by the body. Plastic tone aids in maintaining this position because the muscle fibres exhibiting it are fixed at their new length. After sympathetic ramisection this accessory contribution is lost, but the influence of the cerebral cortex on contractile tone remains. In this connexion it is well known that tone is increased by attention. Dr. Royle has noticed that during the first period of re-education after sympathetic ramisection when the patient's attention is focused on the performance of a voluntary movement, under orders, the cortex greatly increases the amount of contractile tone exhibited in the limb. This increases the difficulty of the patient in performing the movement. On this account gently executed movements are far more effective than considerable effort in this stage of the re-education process.

Evidence is not wanting that plastic tone is of use also during the performance of voluntary movement. In ordinary circumstances a patient who has been subjected to the operation of sympathetic ramisection cannot detect any disability in consequence of the loss of the sympathetic nerve supply of his voluntary muscles. However, to test this matter closely I have observed the effect of sympathetic denervation after the exercise involved in the flight of a bird. During the flight of a sea-gull in which the unilateral operation has been performed, no obvious difference is to be detected in the movement of the two wings. After completing a flight of one hundred metres, however, the position of the wing on the operated side is in marked contrast to that on the normal side (see second lecture). It is drooped and abducted to a remarkable degree, although hardly any deviation from the normal position may have been visible prior to undertaking the flight. The explanation of this observation seems to be that plastic tone enables the fixing muscle fibres to follow up the contraction of the active fibres and assist in maintaining the intermediate positions assumed at all stages of the movement. When plastic tone is removed, voluntary effort is increased in order to maintain these intermediate positions against the action of gravity as well as to perform the movement.

It appears, therefore, that in voluntary movement postural tone, made up of a contractile and a plastic component, is first inhibited; the "movement" muscle fibres then contract and are assisted in maintaining the advantage gained by the plastic tone of neighbouring "fixing" fibres which are passively shortened; and finally cortical impulses determine that contractile tone is exhibited in the muscles whose contraction is necessary to confer the required position upon the body; the length of the muscle when this position is attained is maintained by plastic tone exhibited by "fixing" muscle fibres.

In certain cases of spastic paralysis plastic tone is in excess. This interferes with voluntary activity, because it is imperfectly inhibited at the outset of voluntary effort. When excessive voluntary effort initiates movement the exaggerated degree of plastic tone, which is present in both agonists and antagonists, as Dr. Royle has shown, tends to provide resistance to the execution of the movement by

fixing, to an abnormal degree, the length of the muscles of the limb at all the intermediate positions through which the moving part passes. In this way the effects of diminished voluntary power are enhanced in degree on account of excess of plastic tone, which is no longer adequately controlled by the cerebral cortex. In fact this defective control is not infrequently the greater disability, and on account of it the voluntary motor pathway may be unable to function to the full extent of which it is capable. This desideratum is attained by removing the plastic tone entirely, when the rigidity of the muscles disappears. The result is that the initiation and the execution of voluntary movement are both improved.

Dr. Royle found that one patient, with a gunshot wound of the cerebral cortex, who illustrated the presence of excess of plastic tone to a striking degree before the operation, was able to inhibit the tone of the extensor muscles of the knee following ramisection. He was unable to flex the knee voluntarily, but he could inhibit the tone of the muscles sufficiently to let the leg fall into the flexed position. This was impossible prior to the operation. In other words, this patient was unable to inhibit plastic tone. After ramisection he was able to inhibit the contractile component of tone which alone remained. This patient illustrates that the cerebral cortex normally inhibits both components of postural tone, and that injury may affect the control over the plastic component to a greater extent than that of the contractile element. This accounts for the marked improvement in control which follows sympathetic ramisection.

Consideration of these facts reveals the far-reaching influence in the interpretation of the functions of the cerebrum and cerebellum the further investigation of the central control of muscular tone is likely to exert.

[Hunter was in the midst of his experimental work when he received the invitation from the American College of Surgeons to deliver the Murphy Oration in New York. He and the team of collaborators who were inspired by his enthusiasm were preparing to investigate a host of problems—anatomical, physiological, pharmacological, and clinical—suggested by this work; and it was with the utmost reluctance that he left his laboratory last September. But he realized the value of a personal exposition of his results, and felt it his duty to accept the invitation from America. He fully realized how profound a revolution his work was destined to create in anatomy and physiology; and it is unspeakably tragic that he was not permitted to develop these investigations himself.

I refer to these matters to call attention to the fact that circumstances forced Hunter to make the two announcements of his results at times when he realized their incompleteness. One of these I have just mentioned—the call to New York just at the moment when he had got a clear vision of the host of fascinating problems, the solution of which seemed to be made feasible by his working hypotheses. The first announcement of his work on the sympathetic was made in 1923, during the visit of Sir William Macewen to the British Medical Association in Australia. The work was then still in the early experimental stage; but as the results were being applied to surgery it became necessary to explain the purpose and the principles underlying it for the guidance of those surgeons who felt it their duty to make use of a procedure that seemed to afford a certain hope of alleviating the chief troubles of the spastic paralytic patient.

Hunter had become keenly interested in the problems of the influence of the sympathetic upon visceral functions (which have not been discussed in these lectures); and if he had lived he had intended to embark upon a far-reaching inquiry as to the similarities and differences between the non-striated, cardiac, and striated muscles, and to correlate the actions of the sympathetic system on all three kinds of muscle.

In preparing these lectures for publication I have made free use of the work of Dr. T. K. Potts, published in the *Journal of Anatomy* (January, 1925), and the reports of the Murphy Oration in *Surgery, Gynecology and Obstetrics* (December, 1924); and I have to express my thanks to the editors of these journals (Sir Arthur Keith and Dr. Franklin H. Martin) for their generosity in allowing me to quote freely and copy illustrations. The drawings illustrating these lectures were made by Mr. T. Poulton, mostly from illustrations selected by Hunter himself. Dr. John Beattie and Miss Audrey Russell made special dissections for me to check some of the anatomical points in the relations of the sympathetic rami in man and the fowl. Professor Hunter is in no sense responsible for Figures 2 and 14, which I constructed to give pictorial expression to the implications suggested in his argument.—G. E. S.]

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THE EARLY DIAGNOSIS AND TREATMENT OF PYLORIC STENOSIS IN INFANTS.*

BY

HUGH T. ASHBY, B.A., M.D.CANTAB., F.R.C.P.,
VISITING PHYSICIAN TO THE ROYAL MANCHESTER CHILDREN'S HOSPITAL,

AND

A. H. SOUTHAM, M.D., M.CH.OXON., F.R.C.S.ENG.,
ASSISTANT SURGEON TO THE ROYAL MANCHESTER CHILDREN'S HOSPITAL.

A CLEAR understanding of the nature of pyloric stenosis in infants and the recognition of the importance of early diagnosis, and so treatment, are most essential. We are quite sure that if the condition could be recognized early many lives would be saved. It is more common than is usually thought. By pyloric stenosis we mean a great hypertrophy of the circular and longitudinal muscles which control the passage of food from the stomach to the duodenum. The muscle here becomes enormously thickened and hypertrophied, so as to block the pyloric canal. The consequence of the block is that the stomach wall also increases in thickness and size as it tries to force its contents through the constricted opening into the duodenum. The food, not being able to pass through the pylorus, is forced the opposite way up the œsophagus, and we get the forcible vomiting so characteristic of the disease.

DIAGNOSIS.

Sex.—In the great majority of cases the infant is a boy, but the cause of this is quite unknown. This fact, however, is a help in diagnosis. Eight or nine out of ten cases are boys.

Place in Family.—Many cases occur in the first-born; this looks as if the mother had not been able to produce a perfectly normal infant, but one different in some way. There is, by the way, a special liability of first-born children to abnormalities.

Age.—The condition is often called "congenital hypertrophic pyloric stenosis." This term is somewhat misleading and wrong, for the infants are, for a time anyhow after birth, perfectly well, and they show no symptoms till they are a few weeks old.

Symptoms do not appear till the infant is at least two weeks old, and the commonest time for the vomiting to start is from two to four weeks after birth. The vomiting seldom starts for the first time after the age of six weeks.

Vomiting.—This is perhaps the most characteristic sign, but *only* when the vomiting takes on the character peculiar to the disease. The vomiting is forcible, and the food is shot out of the mouth, even also down the nose, and finishes well away from the infant, as he lies in his cot. The infant does *not* vomit after each feed, but usually twice or three times a day, but when it does vomit more than one feed comes up at a time. The infant who vomits after each feed does not usually have pyloric stenosis. The vomit often has much mucus mixed with the food, showing that the stomach has become inflamed.

Constipation.—As the vomiting begins the infant becomes constipated to a marked degree. The bowels are only moved by enemata, and then only a little at a time. The reason being that little food gets through the pylorus. The intestines become atrophied from disuse, and this is a bugbear after operation, when the food gets through the pylorus

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into the intestines. The vomiting of ordinary digestive disturbances is associated with diarrhoea, not constipation.

Wasting becomes rapid simply from lack of food and fluid, which are not retained, and the child may easily lose 4 or 5 ounces a day. Another characteristic sign is that the baby is greedy for the feeds and takes them well. This is quite unlike the ordinary dyspeptic infant.

Peristalsis.—Waves of peristalsis may be seen passing across the abdomen, due to contractions of the stomach, and they are best noticed while the baby is having a feed. This peristalsis may be seen in other conditions, but it is specially well marked in pyloric stenosis.

Tumour.—The pyloric tumour is usually situated about an inch above the umbilicus, under the right rectus. Some observers state that they can feel the tumour in a high percentage of cases. Personally, we lay little stress on this, as it is often an exceedingly difficult matter to feel the pylorus. The infant is generally cross and holds the abdomen too rigid, and even under the anaesthetic the tumour frequently cannot be felt, as it may be placed deeply under the liver. The failure to feel the hypertrophied pylorus should not prevent a diagnosis of pyloric stenosis.

The reason that cases of pyloric stenosis are often not recognized, or recognized late, is that the food is thought not to agree, and that it is in consequence of this the infant vomits and wastes.

Two things may occur in infant feeding: the baby's food may be wrong and the baby right—this is the commonest thing to happen; or, as in pyloric stenosis, the food is right and the baby wrong. A baby with pyloric stenosis is weaned from the breast because he vomits; the food is thought to be wrong. The vomiting, however, persists, no matter what food is tried, and the breast milk is lost. A baby should never be weaned without a very definite and good cause.

TREATMENT.

The treatment of pyloric stenosis in infancy may be either medical or by operation. It is only within recent years that the real value of operative treatment has been recognized. Directly the condition is diagnosed we are quite convinced that surgical intervention alone will give the best results. In the past much valuable time has been lost by trying medical treatment. Medical treatment has undoubtedly been successful in a certain number of cases, but it is not improbable that some of the cures were really cases of pyloric spasm, and not hypertrophic stenosis. It is doubtful if cases of well marked hypertrophic stenosis are often cured except by operation. As already stated, the condition found is one of true hypertrophy of the pyloric ring, producing obstruction to the outlet from the stomach. Any treatment to relieve this must provide a free exit from the stomach, and experience has shown that this can only be satisfactorily obtained by operation. Further, the ideal operation is obviously one that restores the continuity of the alimentary canal through the pylorus.

Rammstedt's Operation.

The best procedure at the present time is that described by Rammstedt in 1912, and taken up in this country in 1918. This operation consists in transperitoneal incision of the hypertrophied pyloric ring, leaving the mucous membrane intact, thereby restoring the continuity of the alimentary canal. This method has now become widely adopted, and we ourselves are so convinced of its superiority that we carry it out in every case where surgical treatment is decided upon. To anyone familiar with the technique it is easy and quick to perform, and has such obvious advantages over other methods of treatment that it has received almost universal approval, whilst the fact that no suturing of the stomach or intestine is necessary makes it an extremely simple operation. Further, we have met with no cases of recurrence of symptoms necessitating a second operation, as has been recorded after other methods of treatment.

Once operation has been decided upon the pre-operative preparation of the patient is of considerable importance. If the child is in good condition we advise operation at the earliest possible opportunity, as nothing is to be gained by delay. In those cases, however, where symptoms have been present for some time and the child is in a semi-starved condition a delay of perhaps twenty-four hours is justifiable to introduce fluids and thereby improve the chances of success. All cases are treated as urgencies once the diagnosis has been made. Prior to operation fluid in the form of saline and 2 per cent. glucose is introduced into the body by the rectum and subcutaneous injection, and the infant's weight can by this means be raised by as much as 6 ounces in the twenty-four hours. The stomach is washed out with saline to rid it of curds and other offensive contents; this also renders the stomach itself more healthy.

At the time of operation the child is warmly clad and laid on a hot-water bottle in a well heated theatre. All these details are of importance as they help to minimize shock in an infant which has often little reserve power to spare. With regard to the anaesthetic, we now as a general rule prefer warm ether. We have found this more satisfactory than local anaesthesia and gas and oxygen, owing to the poor relaxation so frequently obtained, which adds to the difficulties and time occupied in the operation.

The abdomen is opened by a 1½-inch incision above the umbilicus to the right of the mid-line. The dilated stomach usually presents and is gently delivered through the wound, the pylorus being thereby readily identified. The stomach is then held by an assistant, and this both draws down the pylorus and leaves the operator the free use of both hands. The pyloric ring, which appears as a hard white cylindrical swelling, is incised longitudinally along its upper border with a sharp scalpel. In this situation there are usually no vessels of any size and the bleeding will be practically negligible. The incision is carefully deepened with a blunt dissector till the mucous membrane beneath bulges freely into the gap. In this, the essential step of the operation, two dangers must be watched for: First, haemorrhage, and this can be avoided by making the incision as described, whilst any vessel that may be cut should be under-run and ligatured. Secondly, if the incision is prolonged too far into the thin-walled duodenum the mucous membrane may be wounded and result in leakage of the contents; this can be avoided by dividing the muscle with the blunt dissector rather than with the scalpel.

Having successfully completed this stage and seen that there are no bleeding points, the stomach is returned to the abdominal cavity and the wound closed, saline being introduced into the peritoneal cavity meanwhile. With ether anaesthesia little difficulty will be found in closing the small incision, and the whole operation should take less than ten minutes to perform.

To secure success in these cases, rapidity in operating and the least possible amount of handling of the viscera are of vital importance. Both of these conditions are attained in the Rammstedt operation, and shock is thereby reduced to the minimum. The child should be given salines immediately after the operation, and fluids by mouth are allowed as early as possible. Whenever possible the mother should be encouraged to suckle the baby; this we regard as one of the most important steps in the after-treatment. A doubtful case may be brought through successfully if the mother's milk is available for the child. If breast-feeding is not possible, peptonized milk is likely to suit the baby.

PROGNOSIS.

The prognosis depends largely on the duration of symptoms and the condition of the child when submitted to operation. In early cases there is usually a rapid improvement immediately following operation. If the patient has been ailing for some time and there has been a progressive loss of weight and it is in a semi-starved condition, the mortality is bound to be high. Recovery after operation is uncertain in babies weighing less than 7 lb. As, however, the disease is becoming more readily recognized—and the symptoms are so typical that mistakes should seldom be made—the prognosis will become increasingly more favourable. With earlier diagnosis and opportunity to operate before the child is wasted and collapsed, the death rate should be reduced to less than 10 per cent. This ideal will only be attained when cases are recognized sooner.

In considering the results of treatment, statistics collected from the Hospital for Sick Children, Great Ormond Street, London, show that, during the years 1915-17, 54 cases were

treated, the majority without operation, and the total mortality was 80.5 per cent. Prior to the introduction of the Rammstedt operation in 1918, the operative mortality at this hospital was 100 per cent., not one single case having recovered after operation. In the following year, when the Rammstedt operation was adopted, it fell to 41 per cent. after surgical treatment, whilst in 1923 for 55 collected cases the operative mortality was 29 per cent.

During the past twelve months we have operated on 16 cases, with 5 deaths. This gives a death rate of approximately 30 per cent. Death occurred in 2 cases within twenty-four hours of operation, and was due to post-operative collapse in weakly and debilitated infants. In 3 cases it occurred four, seven, and twelve days later, and appeared to be due to gastro-intestinal disturbances and inability of the infant to assimilate its nourishment.

In cases with a long history it is not unusual to find the intestines small and shrunken when examined *post mortem*, and it appears that death is due to their atrophy from disuse and their failure to recover their digestive function. The average age in these cases was 7 weeks, and the duration of symptoms twenty-one days. The condition most commonly appears in the third week of life.

Whilst fully realizing that the figures here cited are too small to allow deductions to be drawn, they serve none the less to illustrate the average results of surgical treatment of the disease at the present time.

CONCLUSION.

We would conclude by again urging that, once the condition has been recognized, surgical aid should be sought at the earliest possible moment, for in operation lies the quickest and most certain chance of success.

After surgical treatment the infant usually shows rapid improvement and within a few weeks is frequently able to be discharged as cured. Medical treatment, on the other hand, may require months of careful attention, and the ultimate result is often uncertain. If recovery takes place after operation it appears to be permanent; in fact, the majority of those who recovered after operation in infancy are in later life a good deal above the normal weight for age.

A NEW TUBERCULIN.*

BY

ALEXANDER LUNDIE, B.Sc., M.B.Ed.,

D.C.M.S. (PATHOLOGY) MINISTRY OF PENSIONS, W. MIDLAND REGION.

ORGANIC analysis is not likely to yield any single substance capable of producing antibodies to the tubercle bacillus, and if it is carried too far it is not even likely to yield any mixture of substances capable of antibody formation. The most efficient antigen is likely to be a suspension of entire or of pulverized bacilli in normal saline. There are technical difficulties in the way of obtaining ideal products, and these difficulties are aggravated when the antigen is required for immunization experiments or for therapeutic use.

Besredka's antigen is prepared at a high temperature, and most tuberculins are made from bacilli killed by heat. The analytical processes employed to determine the composition of tubercle bacilli mostly involve the use of heat, to kill the organisms if for no other purpose. Heat is required for extracting the acid-fast material from the organisms. I know of no simple solvent that can extract this substance without the prolonged action of heat. A number of observers have noted that hydrochloric acid added to a simple fat solvent is able materially to assist the process of extraction.

If any chemical substance could be found to dissociate this acid-fast substance from its union with other constituents of the bacillus, at a comparatively low temperature and without loss of time, it would make the protein constituents of the bacillus more easily accessible to simple solvents, and would yield them up in a state more nearly resembling the parent substance. Phosphorus trichloride seems to have this action, but it also reacts with the protein constituents of the bacilli. Very definite considerations led to the use of this reagent for the purpose of preparing a tuberculous antigen directly from living organisms. It is not always possible to foretell exactly what will happen when a new reagent is tested. A number of reagents were previously tried, with more or less futile or even alarming results. The process adopted is offensive, and must be conducted with due precautions for safety. Phosphorus trichloride gives a colour reaction with all bacilli and with other organic substances containing protein. The colour is purplish-brown. Enough water must be present to act catalytically; too much will interfere with the reaction, and there will be no reaction with absolutely anhydrous materials. Under proper conditions violent effervescence takes place, and a voluminous evolution of irritating fumes occurs, which cause coughing and headache, which may last for several days.

Although the original mixture is liquid, the end of the reaction is indicated by its becoming a firm pasty mass, which can be liquefied by the addition of water. All the bacilli can be precipitated along with the phosphorized fats by the addition of acetone. This precipitate is the basis of the tuberculin about to be described. Its antigenic action is feeble, but is much enhanced by cholesterin.

Sound guinea-pigs bear relatively large doses of tuberculin, but tuberculous animals are readily killed in thirty-six to forty-eight hours by comparatively small doses. A healthy animal bore a large dose of this new preparation with impunity. A seriously diseased animal also bore the same dose, and even appeared to be better twelve hours afterwards. Twenty-four hours later a second dose, even larger than the first, was given, and borne equally well. Forty-eight hours after the first dose a third dose was given, and next day the animal was markedly better in health. Clearly this substance had not the lethal property of old tuberculin towards tuberculous animals. Its therapeutic action on the same animal was then tried. A weekly dose was thereafter administered until all the enlarged glands became impalpable, while the animal actually became the healthiest and heaviest in the establishment. When it was at last killed no trace of the diseased glands could be found, but there were a few scars of healed tubercles in the spleen, and an area of perisplenitis. An emulsion of the spleen injected into another guinea-pig produced no disease.

The various strains of human and bovine tubercle bacillus differ in virulence, so a culture of bovine bacilli of well established virulence was obtained from the National Collection of Type Cultures for the purpose of the next experiments, which were performed on rabbits.

The rabbit never survives an infection of bovine tuberculosis, no matter how contracted. If the bacilli be inoculated subcutaneously into one of the hind limbs an insignificant glandular enlargement soon arises. After the lapse of a period, depending upon the mass of the bacilli inoculated, general symptoms supervene. General miliary tuberculosis sets in and rapidly kills the animal. On *post-mortem* examination none of the lesions shows any evidence of circumscription. They tend everywhere to spread diffusely.

Five young rabbits were each inoculated intraperitoneally with 5,000 million virulent bovine tubercle bacilli. One was kept as a control without subsequent treatment. In six days its temperature had risen two degrees, and in eleven days four degrees. Its weight varied, reaching a maximum in eighteen days; it died in thirty days, weighing exactly the same as at the beginning.

The second rabbit was treated with the new tuberculin. It gained weight for twenty-one days. It was accidentally injured, and died on the twenty-second day.

The third rabbit became ill five days after inoculation. On the eleventh day its temperature was 105.3° F. Treatment was then commenced. It gained weight for thirty-one days, but the temperature remained high, and it died on the fortieth day.

The fourth rabbit became ill one day earlier than the others. Treatment was commenced on the tenth day, and it died on the thirty-fifth day.

The fifth rabbit became ill on the sixth day. Treatment was begun on the eleventh day, but in this case human, not bovine, tuberculin was used. All the other rabbits were treated with bovine tuberculin. This animal trebled its weight in fifty-five days. The local infection soon became sharply delimited from the surrounding healthy tissues and began to heal. The animal was killed at that stage on account of my holiday arrangements. *Post mortem* the lungs showed large, well defined tubercles in process of healing.

* A paper read before the Birmingham Branch of the British Medical Association, November 20th, 1924.

A pair of larger rabbits was infected by the subcutaneous instead of by the parenteral route. Both were decidedly out of sorts in seventeen days. Treatment was commenced on the twenty-sixth day. The first had already begun to decline seriously eight days before, owing to the infection having been intentionally accelerated by massage of the infected glands. Tuberculin of human origin was administered to both animals, but the first died thirty-five days after infection, without having made the slightest sign of rallying.

The second rabbit of this pair was seriously ill within sixteen days of infection, and treatment was commenced ten days later, and continued to the fifty-sixth day after the original infection. Only seven doses of tuberculin were given altogether. This animal increased in weight long after treatment was stopped, for nearly five and a half months. Eventually it was seized with nasal catarrh and signs of pneumonia. Nasal catarrh had never been observed in any of the other animals; it was probably a superadded infection by one of the pasteurella group of organisms, and on this supposition the animal was promptly killed. *Post mortem* large healing tubercles were found in both lungs as well as fresh haemorrhagic patches. The site of infection was completely healed, but there was a large subscapular tuberculous gland, circumscribed by healthy tissue, though otherwise certainly capable of rekindling the infection.

This case and the last one of the other series were both decidedly encouraging, because rabbits at the best are difficult to manage under experimental conditions. Many die from accidental causes, and it says much for the care and skill of my assistants that the death rate of both rabbits and guinea-pigs is the lowest that I ever heard of. All these animals were very severely infected before treatment commenced, and they were all treated with very excessive doses of tuberculin. Not one reacted fatally to this excessive dosage.

Man has a much greater natural resistance to tuberculosis than the guinea-pig or rabbit, and his treatment is accordingly more satisfactory. Still, I have little fear about the results of my next animal experiments, if I think it necessary to resume them. As soon as it was thoroughly ascertained that the use of this tuberculin was perfectly safe for animals, I took advantage of the courtesy of Mr. Gemmill, and later of Mr. Naughton Dunn, who enabled me to treat cases of lupus vulgaris and of surgical tuberculosis. These cases responded very favourably.

Lupus erythematosus has responded to treatment even more rapidly than lupus vulgaris. But I consider an apparent cure not to be beyond danger of relapse, and would advise further treatment for eighteen months. I am indebted to Mr. Yates and Mr. Heath for cases of this disease.

I am indebted to Dr. Taylor of Syston, Leicester, for the first reports on the treatment of pulmonary tuberculosis with this tuberculin. I deliberately avoided treating this disease until I had studied the effect of treating the other forms of tuberculosis. Encouraged by Dr. Taylor's reports on advanced chronic cases, I undertook the treatment of a very advanced case of phthisis. I am indebted to Dr. Castellain for an introduction to this case, and to Dr. Garbutt for permission to attend and give the necessary treatment.

There were physical signs in both lungs and large cavities in the upper lobe of the right lung. The prospects were as hopeless as could be desired for the trial of a new method of treatment, and in that opinion we all concurred. The patient was aged 23, and was herself a good example of the "spes phthisica." She was quite sure she was recovering. She had three doses of the bovine tuberculin, followed by a course of autogenous tuberculin, beginning with a dose of a millionth of a gram. All anorexia rapidly ceased, the appetite became excellent, and sleep was restored; sweats ceased, sputum was reduced from about two pints a day to about a quarter of a pint. The pulse became regular and much slower (144 at first, afterwards 88), respiration was calm, tubercle bacilli were comparatively scanty in the sputum, and the physical signs greatly improved. The temperature became more equable, but was slower in coming under control than any other symptom. Flesh was put on quite obviously.

Later the patient had a complete pneumothorax of the right side. The temperature rose to nearly 103°, but it afterwards returned to normal, and she made some progress. Nineteen days after the occurrence of the accident the lung apparently collapsed again suddenly and death quickly ensued. She had been examined regularly all the time, and the lung was found to be expanding.

The principle I have enunciated is probably applicable to the treatment of leprosy and certain other diseases. The nastin treatment of leprosy by Professor Deycke of Constantinople is akin to it, but nastin is very toxic.

I am indebted to the Director-General of Medical Services, Ministry of Pensions, for permission to publish this paper.

PLEURAL REFLEX ASSOCIATED WITH FRACTURE OF THE TWELFTH RIB.

BY

GLADYS M. WAUCHOPE, M.D., M.R.C.S.,

HOVE.

THE following case seems worthy of record as a striking and unusual complication of fractured rib.

An unmarried woman, aged 41, fell from a stool on the night of July 15th, 1924, striking her back against a chest of drawers. There was an abrasion of the skin extending vertically upwards from a point below the level of the last rib about four inches from the right border of the spinal column. The twelfth rib was fractured about midway between its junction with the vertebra and the abrasion.

Strapping was applied, and the patient remained in bed, experiencing, for the first few days, considerable discomfort and pain even on slight movement. Four days after the accident she had an attack of hiccup lasting for some hours; both before and after this she had an occasional single hiccup. Progress was otherwise uneventful, and on July 28th the patient got out of bed for the first time. The next morning, when out of bed, she stooped for something and was suddenly conscious of a feeling of faintness, breathlessness, and palpitation, accompanied by severe pain in the upper part of the sternum. She felt very ill and thought that she was going to die. When seen an hour later she was pale, anxious, and dyspnoeic. The pulse (136 a minute) was feeble, and small, but regular. The heart was not enlarged. Harsh, rapid, and shallow breath sounds were heard all over the lungs. There were no areas of diminished resonance and no adventitious sounds. The temperature was 98° F. Adrenaline and cardiac stimulants were administered and the breathing improved; the general condition, however, remained serious during the day. In the evening the pulse rate was still 136, and the temperature had risen to 100.8° F. There were no physical signs in the chest and no pain at the site of fracture.

After this improvement was steady. The pain in the upper part of the sternum was continuous until the third day; it was not increased by breathing or movement. The temperature fell gradually, and was normal on July 31st (fourth day). On August 2nd the pulse rate was 72, the respiration rate 20, and the general condition good. The patient was allowed to get up. From about August 1st onwards, when all acute symptoms had subsided, involuntary sighs occurred from time to time, seeming to the patient to arise from the mid-sternal region. They continued two or three times a day for about a week, ceasing gradually. There was no further interruption to convalescence.

It seems probable that the sudden movement of stooping irritated the nerves of the pleura, either by tearing an adhesion or by friction, and so gave rise to a pleural reflex of the vasomotor type.

A consideration of the anatomy of the part shows that the pleura and diaphragm are in close proximity to the twelfth rib at the site of fracture, the external arcuate ligament of the diaphragm being attached to the tip and lower margin of the twelfth rib and to the transverse process of the first lumbar vertebra. The lung is above, reaching only to the eleventh rib, while the pleura extends to below the twelfth. In the normal subject the kidney would be liable to injury through the pleura and diaphragm, but in this patient it was movable and well below the level of the rib.

Pleural reflex or pleuro-pulmonary reflex has usually been recorded in connexion with operative thoracentesis. Stivelman[1] concluded that in over 75 per cent. of cases there was injury to the visceral pleura and underlying lung tissue. Capps,[2] however, has shown experimentally that the reflex can be occasioned by irritation of the pleura alone, the healthy pleura being much more tolerant than inflamed pleura. It is probable that, in the case reported, the pleura had been injured. The patient experienced more pain and discomfort than usually attend simple fractured rib, while the hiccup during the first week points to involvement of the diaphragm and therefore of the diaphragmatic pleura. The inflammatory reaction may well have persisted till the thirteenth day, when the cardio-respiratory symptoms occurred.

The sighing which arose during convalescence calls for some comment. Physiologists explain sighing as a deep inspiration following, and compensating for, a temporary cessation of breathing.[3] Various causes which depress the respiratory centre may give rise to sighing—for example, cerebral anaemia and the excessive use of tobacco. It also occurs when the mind is deeply engaged, so that people unconsciously sigh at their work.

In the case under review a cause for suppression of respiration might be found in the injured pleura and

diaphragm; or, since the patient was up and about, the sighing may simply have resulted from cerebral anaemia connected with the recent vasomotor disturbance.

REFERENCES.
[1] Stivelman: *Amer. Journ. Med. Sci.*, June, 1923, 836. [2] Capps: *Oxford Medicine*, 1920, vol. ii, 163. [3] Hutchison: *Applied Physiology*, Arnold, 1908, p. 221.

ARSENICAL POISONING TREATED BY SODIUM THIOSULPHATE.

BY
HILDA M. HALLIDAY, M.R.C.S., L.R.C.P.,
AND
CHARLES E. SUTHERLAND, M.B., B.S.MELB., M.R.C.P.LOND.,
ASSISTANT MEDICAL OFFICERS, ST. PANCRAS HOSPITAL, LONDON.

THE following case is of importance as a sequel to the communication from Dr. H. C. Semon in the BRITISH MEDICAL JOURNAL of April 12th, 1924.

A woman, aged 30, became infected with syphilis towards the end of her fourth pregnancy. She had been treated by intravenous injections for ten months, and had then been advised to take six weeks' rest from treatment. Three weeks after the last injection, and five weeks before she came under our care, she became jaundiced, and noticed loss of power in the arms and general weakness; she passed dark urine and pale stools. For seven days prior to admission she had vomiting, anorexia, constipation, insomnia, and failing vision.

On admission there was deep generalized jaundice, the mouth was dry and dirty, and answers to questions were correct but monosyllabic and very slow. There were no physical signs of neuritis, but the hands could not be lifted, and the vision was bare perception of light. The liver dullness was diminished; the urine contained albumin and bile.

While awaiting a supply of chemically pure dehydrated sodium thiosulphate we gave the patient 30 grains of the stock salt in solution by the mouth every four hours, and continued this method of administration throughout the first week. There were no resultant toxic symptoms (colic or diarrhoea), but there was no arrest of the arsenical symptoms. By the third day the patient was apparently moribund; she vomited frequently and in excess of intake; she was restless, apathetic, and doubly incontinent; the bowels acted only after enemata.

At this stage the first intravenous injection was given, and for ten days the patient had 0.45 gram daily, followed by seven similar doses on alternate days, making a total of 7.65 grams spread over a period of twenty-six days. In addition, during the first week she took about 80 grams by the mouth, but probably much of this was lost by vomiting. From the first intravenous injection the downward trend was arrested. After five doses the mental condition was perfectly clear, muscular power of the arms was good for all movements, and the patient could read small print. She was still jaundiced, incontinent, and vomiting. There was still bile in the urine, and leucine was seen in the deposit. At the end of the third week she was convalescent and able to be up for half the day, eating well, and not vomiting; the jaundice was almost gone, and the urine normal.

The levulose tolerance was tested and seemed to show a definite derangement of liver function during the height of the illness, with rapid recovery under treatment. The deterioration in her general condition during the first two days clearly demonstrated the progressive nature of the disease and emphasized the remarkable improvement following intravenous administration of the specific remedy.

Levulose Tolerance.	April 25th.	May 13th.
Fasting blood sugar	0.131	0.100
Half an hour after levulose	0.137	0.086
One hour after levulose	0.218	0.103
One and a half hours after levulose	0.206	0.106
Two hours after levulose	0.266	0.100

We should like to express our thanks to Dr. Thackray, Medical Superintendent, for permission to publish this case.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

MALIGNANT CERVICAL ADENITIS SIMULATING ANEURYSM.

THE case here recorded, though disappointing from a diagnostic point of view, is interesting as illustrating how very closely cervical adenitis may simulate aneurysm. An exploring needle would have settled the diagnosis, but as nothing was to be gained by the procedure it was not carried out.

A woman, aged 79, was admitted to the Tooting Bec Hospital in August, 1923. She showed evidence of specific disease, and her history confirmed this. On October 14th, 1924, she suddenly developed a tumour about the size of a hen's egg above the right clavicle. As far as can be ascertained this took only about a week to become apparent. The tumour was slightly irregular in shape and was distinctly expansile. Two little flags, one on either side of it, separated about a quarter of an inch with each beat of the heart. The heart rate was 66 and the blood pressure 130. There was no appreciable difference in the two radial pulses, but the right radial pulse gave a tracing exactly similar to that of a subclavian aneurysm portrayed in Hutchison and Rainy's *Clinical Methods*. There was a distinct systolic bruit over the aneurysm and over the aortic area. This is interesting as an illustration of a contribution I sent to the JOURNAL some time ago entitled "An aortic murmur."

A month later the tumour was noted as much larger—the size of a small orange—and the radial pulse as being much altered. The patient was treated with potassium iodide, being rapidly advanced to 40 grains every four hours, and showing no unpleasant symptoms from the drug. The size of the tumour in a week's time was distinctly less and there was a constricting band at the back of the mass. The following week the mass increased in size and the potassium iodide was discontinued. The blood pressure was 135, and the radial pulse tracings were similar, with no morbid characteristics. All this time there was little or no complaint of pain, and the patient died on December 5th from a low form of terminal pneumonia.

At the necropsy a large mass of cancerous glands was found completely encircling the subclavian and carotid arteries with secondary deposits in the mediastinal glands and deep in the liver.

The diagnosis made was a carotid aneurysm involving the subclavian and possibly innominate arteries, and several persons of wide experience saw the patient and found no fault with the conclusion arrived at. When the change in size was brought about by administration of potassium iodide it was thought that that clinched the diagnosis. The systolic bruits were, of course, caused by compression of the artery, and not by the constriction at the entrance or exit of an aneurysmal sac.

I am indebted to Dr. E. H. Beresford for permission to publish the case.

THOMAS LINDSAY, M.D., F.R.C.S.Ed.
Tooting, S.W.

IMMUNITY, SPECIFICITY, AND NON-SPECIFIC FACTORS.

IN the issue of December 13th, 1924 (p. 1098), Dr. R. A. O'Brien says: "It may be that the administration of *coli* vaccine does materially influence the course of typhoid fever and of arthritis, but we feel that we must have more evidence before accepting the claim." In view of this the following case of colitis and arthritis cut short by an attack of typhoid fever, and the recovery from the typhoid fever, is of interest.

A girl, aged 18, suffered since the age of 13 from attacks of subacute arthritic rheumatism. She had suffered for some years before this from five or six loose motions a day. An examination of the stools showed enormous number of *B. coli*. The arthritis was most probably caused by the colitis. At 18 years of age she contracted typhoid fever. The fever was complicated by severe haemorrhage on the twenty-third day of the disease. Widal's test was positive. The temperature fell to normal on the forty-second day of the illness, and health and strength gradually returned. The arthritis and stiffness of joints disappeared and have not returned, though it is now more than three years since recovery from the typhoid fever. The motions are now one or two a day.

One case proves nothing, as it may be entirely coincidence, though even coincidence has a cause; but the recovery from the typhoid fever and the cutting short of arthritis and of colitis appear to me to be sufficiently interesting to record, especially to those who successfully treat typhoid fever by *coli* vaccine, or those who successfully treat arthritis by intravenous injections of *B. coli* or typhoid bacilli.

J. E. BOLTON.
Queen Camel, Somerset.

Reports of Societies.

THE MILK SUPPLY AND HEALTH.

AT a meeting of the Medico-Chirurgical Society of Edinburgh held on February 4th, the President, Sir DAVID WALLACE, in the chair, Sir ROBERT PHILIP opened a discussion on the milk supply of the country and its bearing on health.

Sir Robert Philip pointed out that in February, 1913, a committee of the society had been appointed to inquire into the relation between the milk supply of Edinburgh and the prevalence of tuberculosis. The committee came to the conclusion—largely on the findings of Mr. Fraser and Mr. Mitchell—that the infection of children with bovine tuberculosis was prevalent in Edinburgh. It recommended: (1) that the members of the society should advocate strongly the advisability of boiling milk, (2) that the town council should be asked to reorganize milk examination and the supervision of cows, and (3) that the Government should be urged to carry through at an early date a milk bill along the lines of such bills as had been previously considered by Parliament. The further efforts of the society had been interrupted by the war. Reference was made to the Milk and Dairies (Scotland) Act, 1914, and the causes for its delayed operation due to the war. The Amendment Act of 1922 was also cited; it was probable that this Act would come into operation in September, 1925. Among other important provisions the Act allowed the Scottish Board of Health on January 1st, 1923, to make regulations for the production and sale of graded milk and to grant licences to producers and dealers accordingly. In June, 1923, the Board issued a Milk (Special Designations) Order (Scotland), and later a short Amending Order regarding the conditions applicable to pasteurization. Apart from pasteurization three grades of milk were recognized, which were shortly summarized. Since this Order was passed there had been a marked increase of interest and activity amongst producers in the direction of higher grades of milk. In England on December 31st, 1920, the number of licences for the production of certified milk was 9; on December 31st, 1923, it was 55. In Scotland at present there were 9 licences for the production of certified milk, and 19 for grade A (tuberculin tested) milk. Reference was made to the experimental dairy farm at Gracemount, under the management of the Royal Victoria Hospital Tuberculosis Trust of Edinburgh. The purpose of grading milk was then discussed, the essential point being cleanliness. The composition of milk was briefly detailed and some observations were made about its bacteriological content. It was estimated that 50 per cent. of milk cattle in this country were tuberculous, 2 per cent. being in an advanced state of tuberculosis. Much attention had been devoted to the question of freeing herds from tuberculosis in Denmark and the United States, and more recently in Great Britain. Bang's experiments in Denmark were cited. Reference was made to the danger of contamination from the milker's hands, etc., and to the question of housing cattle, with comments on the habits of milkers, the mode of milk transit, and the process of bottling in many dairies. Sir Robert Philip then outlined the present outlook, and referred to the need of close veterinary inspection, a healthier life for cows, instruction to dairy workers in cleanliness, and the significance of proper cooling of milk. Many of these objects had been achieved by the influence of the National Clean Milk Society and similar agencies, while clean milk competitions had been also of service. If a pure milk supply was to be provided it should be plentiful, for the people generally ought to consume more milk. It had been estimated broadly that only about half as much milk per individual was consumed in Great Britain as compared with the United States. Public education was required to popularize milk, and reference was made to some of the methods adopted by American milk vendors to instruct their customers. The producer must also be trained to realize the value of having a sound herd, and that better education of the people would create an adequate demand for certified milk. The providing by some authorities of preserved, dried, or tinned milk at child welfare and maternity centres was deprecated. Good milk was at times more difficult to obtain in country districts than in the town. The question of pasteurization was discussed and the risks of inadequately carrying out this procedure were pointed out. If pasteurization was permitted at all it should only be considered a provisional measure, the scientific finger of preventive medicine pointing clearly towards an ultimate goal of a pure natural milk supply. Legislative and administrative measures were mentioned, and also the duty of the medical practitioner in helping to establish the demand for a clean milk supply. In conclusion Sir Robert Philip said, "It is my earnest hope that the discussion will lead somewhere, and that the collective view of the profession may be effectively expressed in support of the legislative proposals and the administrative endeavour by the Board of Health to secure and develop for the nation an abundant supply of sound milk."

Professor T. J. MACKIE discussed the bacteriology of milk. He compared the bacteriological content of milk with that of accepted water supplies, to the disparagement of the former. He referred to some of the organisms found in milk and the dangers which might arise from consuming milk so contaminated. The well known fact was noted that in this country the main hygienic problems in regard to milk are related to tubercle bacilli and the etiology of infant diarrhoea, and the established fact that bovine tuberculosis is commoner in children was cited. He thought that tuberculous milk would still be used for a long time, and that the only immediate remedy lay in destroying the bacilli. Reference was made to infantile diarrhoea and the various causative factors, including the dysentery group of organisms in the severer cases. He doubted the value of pasteurization, since it was a technical process, and therefore might fail; he favoured boiling as the more simple procedure, and the nutritive deficiency of boiled milk could be compensated in infant feeding. Finally he referred to the necessity of education of the public both from the point of view of purity of milk and increased efficiency in the dairy.

Dr. J. F. TOCHER discussed the variations of the constituents of milk in normal cows, the chief variation being in the quantity of butter fat. He drew attention to the difference between the readings of "bulked" milk from a large herd and the readings from individual cows. Under the auspices of the Scottish Interdepartmental Committee on Milk, samples from individual cows were obtained from local authorities all over Scotland throughout every period of the year. These were analysed, and a monograph on the subject would be published this year. The average figures and range of variation in individual cases were shown by means of diagrams: 10 per cent. of the samples gave less than 3 per cent. butter fat. In the case of "solids not fat" 24 per cent. of individual samples gave less than 8.5 per cent., which was the prescribed presumptive limit; this did not show in "bulked" milk from a large herd. The important non-fat constituents were lactose, ash, casein, and albumin. The percentage of lactose varied from 2.7 to 5.5, the numbers for the low percentages being small compared to the high percentages; the reverse held good for albumin. It was noted that a heavy-milking cow on the average gave a higher percentage of lactose than a poor-milking cow; also, the higher the percentage of lactose the lower was the percentage of albumin. It seemed probable that in each individual cow there was a lactose secretion sufficient to secure osmotic pressure in secretion of milk equal to the osmotic pressure of the blood. Age and breed had important bearings on the various constituents of milk. The percentage of butter fat fell in cows from 3 to 12 years: young cows gave a higher percentage of lactose than old ones, while the percentage of albumin was greater in older cows. The percentage of lactose first rose, then fell, during the lactation period, while the reverse took place with albumin. The lactation period showed a wide range—from twelve to sixty weeks. The data regarding the composition of human milk were scanty: in order to get approximate results several thousand samples would have to be submitted to the same careful statistical analysis as that applied to cow's milk.

Dr. GERALD LEIGHTON of the Scottish Board of Health discussed the law in respect of the control of the infection of milk with tuberculosis. He first pointed out what the law did not contain, because no full system of control had ever been put into operation in Scotland. He referred to the lack of compulsion in having dairy cows inspected regularly, the failure to slaughter or isolate the tuberculous cows in country districts, and the omission of a health certificate when selling a cow; milk sold in shops was not regularly examined to ensure its freedom from disease. He then described briefly certain aspects of the Dairies, Cowsheds, and Milkshops Orders of 1885, 1887, and 1899, and passed on to certain aspects of the Public Health (Scotland) Act, 1897, in so far as it related to the examination of milk supplies relative to infectious diseases. The Milk and Dairies (Amendment) Act, 1922, was mentioned in reference to the clauses dealing with the sale by farmers of tuberculous milk, but it was pointed out that there was nothing to prevent a farmer from selling a cow with a tuberculous udder. The Burgh Police (Scotland) Act, 1903, was discussed with reference to certain sections which referred to cows and tuberculosis. These provisions did not appear to have been much used owing to technical and other difficulties. The Milk and Dairies (Scotland) Act, 1914, was a very important statute, though its operation was postponed in consequence of the war, and was not yet in operation. It applied to burghs and districts, and when put into operation would go far to clear up the defects in the existing law. The Scottish Board of Health had power to make it operative on or after September 1st, 1925. In Section 3 it provided that the Scottish Board of Health might require the appointment of veterinary inspectors for the purpose of examining cattle in every burgh and district in Scotland, the cattle to be examined once a year in each district. In Section 14 dairymen were required to notify the local authority of the existence of any cow with any sores on the teats accompanied by bleeding or suppuration, or of any cow known to give tuberculous milk. In Section 17 it was provided that milkers must show a medical certificate that they were not suffering from an infectious disease. There was, however, no prohibition from sending diseased cows to market. The grading of milk had made steady progress since it was instituted by an order of the Scottish Board of Health in terms of Section 3 of the Milk and Dairies (Amendment) Act, 1922.

Mr. ARTHUR GOFTON, chief veterinary inspector of Edinburgh, described the application of the tuberculin test to cattle. In cattle practice the subcutaneous, ophthalmic, and intradermal tests were employed, Koch's old tuberculin being used. Bovine tuberculin was generally used, but that made from human bacilli of proved potency was as useful. Avian tuberculin was unreliable. He then described the subcutaneous test in detail, pointing out the precautions to be taken before the test was performed and during it; he added that a large drink of cold water might temporarily reduce a febrile temperature to normal limits. Tuberculin, he explained, was harmless to pregnant cows provided that parturition was not imminent or they had not recently calved. In the application of the subcutaneous tuberculin test to a dairy herd it was usual to find a decrease of milk secretion which might vary from 3 to 15 per cent. without a single reactor being present in the herd. This decrease was only temporary. Tuberculin was probably a factor in this decrease, but the unusual disturbance and handling of the cows during the test was also an undoubted factor in this temporary decrease. Reference was made to the interval necessary between tests; two months was considered adequate. The ophthalmic test and the intradermal or intracutaneous test were then described. Summarizing the comparative value of these tests, Mr. Gofton said that not one of the three was infallible. The subcutaneous test had the highest diagnostic value, despite some of its imperfections; errors would rarely exceed 5 per cent. The ophthalmic test was the least reliable when performed alone, and the intradermal took a place midway between the other two. Under the Milk (Special Designations) Order combined subcutaneous and ophthalmic tests were required in respect of herds supplying tubercle-free milk. Finally, a brief reference was made to the question as to what period of time must elapse after infection before an animal would react to tuberculin. Experimental evidence went to show that the shortest and longest periods were eight to fifty-one days after infection. From his own experience, if it was desired to eliminate the risk of introducing into a clean herd an animal which harboured infection in latent form, newly purchased animals should be tested at once and again three months later, isolation being maintained during this time.

A cinematograph film to illustrate the production of "certified milk" at Gracemount Farm was shown by Dr. J. C. SIMPSON. The preparation of this film was arranged by the Royal Victoria Hospital Tuberculosis Trust, which owns the farm.

Dr. DRUMMOND SHIELS, M.P., stated that he had long been interested in this question since Fraser and Mitchell had published their results in tuberculosis of bones, joints, and glands, as well as their reports on the frequency of tubercle bacilli in milk. He gave some statistics of the occurrence of tuberculous infection in milk in Manchester, and referred to Griffith's findings with reference to the diminishing frequency of bovine bacilli as age advanced. He also gave some recent figures for Edinburgh. He urged that the medical profession should acquaint the authorities with the serious position of the milk supply of the country so that parliamentary action might be taken.

Dr. CHALMERS WATSON referred to the difficult question of the relation between the producer of certified milk and the demand for it. He also touched on some of the important bacteriological questions in relation to the subject, and referred to other organisms besides the coliform and tubercle bacilli. He was convinced that the society should make appropriate use of the discussion for educative purposes.

Dr. KEPPIE PATERSON and Dr. JAMES YOUNG urged the necessity of vigorous action to obtain a pure milk supply.

A resolution, proposed by Sir ROBERT PHILIP, that the council of the society should be empowered to bring to the notice of all those concerned, including members of Parliament, the urgent need for a clean milk supply, was carried unanimously.

PITUITARY DISEASES.

A MEETING of the Clinical Section of the Royal Society of Medicine was held on February 13th, with Dr. NEWTON PITT, the President, in the chair.

Dr. DOUGLAS FIRTH showed two cases. The first was a case of Fröhlich's syndrome in a boy, aged 17, who showed extreme obesity with absence of axillary and pubic hair. His memory was defective, and he suffered from frontal headaches. The blood sugar curve indicated the existence of an increased sugar tolerance. *X*-ray photographs of the skull showed an apparently normal pituitary fossa. Dr. Firth's second case was one of syphilitic anterior and posterior pituitary derangement, exhibiting polyuria, thirst, and hyperglycaemia. A comparison of recent *x*-ray photographs with those taken some months previously appeared to indicate some thickening in the region of the sella turcica, which was believed to be a bony reaction to syphilitic infiltration. Dr. C. C. BEATTY showed a case of pituitary tumour, with infantilism, in a young man, who had ceased to grow at the age of 13. He was now 4 ft. 4½ in. in height, and weighed 4 st. 12 lb. No hair was present on the face, nor in the axillary and pubic regions. The breasts were enlarged, and the external genitalia were of the infantile type, neither testis having descended into the scrotum. Although the intelligence of the patient was good, signs of an intracranial lesion were present, including optic atrophy and bitemporal hemianopia. The urine was normal and the Wassermann reaction negative. An *x*-ray examination showed enlargement of the sella turcica. Dr. Beatty advocated operative treatment in this case on account of the progressive failure of vision. Cases of acromegaly were shown by Dr. NEWTON PITT, Sir PERCY BASSETT-SMITH, and Dr. GEORGE RIDDOCH.

Dr. F. PARKES WEBER showed a case of developmental deformity of the right forearm, similar to that occurring sometimes in cases of multiple exostosis (diaphyseal aclasis). The patient, aged 18, was a large and powerfully built young man, with a shortened curved right forearm, and

marked ulnar deviation of the hand. *X*-ray examination revealed new bone formation in the ulnar concavity along the attachment of the interosseous membrane, similar in nature to that seen in cases of multiple exostosis. Although no exostoses were present in this case the other bony changes were similar to those frequently seen in association with this condition. **Mr. PHILIP TURNER** showed a girl, aged 14, with enormous and increasing enlargement of both breasts. As he considered that the enlargement was probably due to multiple and rapidly growing fibroadenomata he proposed to amputate, for in his experience *x* rays had little or no effect upon this condition. **Mr. N. ST. J. G. D. BUXTON** showed a case of hairy black tongue. The black part was limited to a V-shaped portion of the back of the tongue, and could be removed with gauze. The condition was said to be due to an overgrowth of the fungiform papillae, and, according to the more recent theories, was not associated with the growth of fungi or any special bacteria. This case was discussed by **Sir STCLAIR THOMSON**, who had seen between thirty and forty similar cases, mostly discovered accidentally during routine examination. Rubbing the affected part with hydrogen peroxide had generally been curative. **Dr. C. F. T. EAST** showed a case of diabetes insipidus following syphilis, the symptoms of which had been controlled by subcutaneous injections of pituitrin. This case was discussed by **Dr. PARKES WEBER**, who had had a similar case in which the disease was familial; there was said to have been an unbroken history for two hundred years.

DISEASES OF THE CLIMACTERIC.

A MEETING of the Chelsea Clinical Society was held on February 17th, with **Dr. GORDON LANE**, the President, in the chair.

Sir THOMAS PARKINSON opened a discussion on the diseases of the climacteric in both sexes. Many men at this time of life showed changes in arterial tension with or without renal changes. He pointed out the uselessness of attempting to reduce the blood pressure in these cases by means of drugs, and said that alteration in the environment, with lessened diet and rest in bed, were the best methods of relief. He then gave an account of the changes seen in the female at the climacteric. He considered that the flushings occurring at this time were due to the loss of ovarian secretion, and that this loss interfered with the action of the thyroid and adrenals. At this period of life in both sexes the endocrine organs were very erratic in function. The upset of the normal mental condition was due, in many cases, to the thyroid, and the cause of the excessive headaches was, he thought, affection of the pituitary gland. It was most important that men should be treated before definite changes had been established in the vascular system. He believed that people of both sexes ate far too much generally, and that such excess was most harmful at this period of life.

Mr. A. RALPH THOMPSON put the climacteric age as being about 55 to 63 in the male. He showed that sepsis was more common in the male than in the female at this time of life, and that the chief septic changes were associated with gangrenous or necrotic processes. He referred to the occurrence of growths of the bladder, and thought that the practical side of this question was very different from that described in the textbooks. He also drew attention to the comparatively early age at which enlargement of the prostate gland gave rise to symptoms. He operated upon this condition, not so much for the mechanical obstruction that it produced, but because the enlargement so frequently led to disease of the kidney, sometimes chronic interstitial nephritis. He thought that the general rule with regard to growth of the prostate should be the same as that applying to other organs of the body, and said that he had had several patients with malignant disease which had not been anticipated when the enlargement of the prostate was first diagnosed. He thought that to wait for fixity and irregularity of a large prostate was to put off adequate treatment until too late, since these were symptoms of the involvement of other organs. The speaker then reported certain clinical facts he had observed in connexion with cancer of different parts of the body. He gave figures showing that in malignant cases the thyroid was, on an average, of greater capacity by 6 c.cm. in malignant than in non-malignant cases of death; some of the thyroids in cases of malignant disease were very large. Acting on these and other observations, he had been in the habit of giving calcium and thyroid extract, and in inoperable carcinoma of the bladder some success had been obtained by this treatment. In one case the growth had apparently disappeared and in others it had seemed to make no headway; in some cases weight had been gained by the patients. He thought cancer was a deficiency disease.

Dr. THEODORE HYSLOP pointed out that many men exhibited mental symptoms at about the age of 50, and he thought that this was associated with the periodical retention of uric acid in the system. He advocated saline purges for this condition with diaphoresis.

The PRESIDENT drew attention to the possibility of the patient having started life in a wrong manner, initial errors being emphasized as the patient grew older. He agreed with Sir Thomas Parkinson that the diet was too liberal in many cases. He mentioned, in particular, arteriosclerosis, chronic nephritis, and glycosuria as being the common diseases of this period of life.

CHOLECYSTOGRAPHY.

AT a meeting of the Liverpool Medical Institution on February 12th, **Dr. R. E. ROBERTS** and **Dr. HENRY COHEN** read a short note recording their observations on cholecystography by Graham's method. This method was based on the use of a salt, opaque to *x* rays, which, when injected into the blood stream, was excreted by the liver, entered the gall bladder, and was there concentrated, thus rendering the gall bladder under normal conditions opaque to *x* rays. In their investigations the sodium salt of tetrabromphenolphthalein was used throughout. Details of the technique adopted were given, emphasis being laid on the necessity for slow injection of the dye and for the control of the patient as regards diet during the ensuing forty-eight hours. In most cases a slight reaction due to vasomotor shock was observed after the injection, but in no case was any serious symptom encountered. Radiographs of the gall bladder area were taken at four, eight, twenty-four, and thirty-six hours after the injection. The rationale of the method was explained and radiographs, illustrating the appearances in normal and pathological gall bladder conditions, were shown. Records of ten cases in which the gall bladder was investigated by this method and in which operations were subsequently performed were detailed; also of four cases which were not operated on. Of seven cases where a pathological condition of the gall bladder was found at operation, only one case had given the slightest *x*-ray evidence of this by the ordinary method, whilst all had given evidence of pathological changes when examined by Graham's method. Of two cases where a definitely normal gall bladder was found at operation, both had given definite indication of a normal gall bladder by Graham's method. In the remaining case a pathological gall bladder was deduced from the findings by Graham's method, but at operation no gross disease was found, a slight adhesion in the region of the neck of the gall bladder being the only abnormality present. This method was thus seen to be of definite value as a diagnostic aid in the examination of the gall bladder in those cases where by the ordinary direct method of radiography a negative finding was obtained; by no other means short of operation could it be ascertained whether a negative finding signified a normal condition of the gall bladder or not.

Mr. H. DE LISLE CRAWFORD described a rapid method of doing appendicostomy by a stab incision at the close of an abdominal operation, the purpose being to give large quantities of water and glucose for several days. The method was useful in emaciated or shocked patients where there was a danger of post-operative vomiting. He described also a new technique for permanent colostomy through a one-inch incision, by which a neat, well controlled opening

was obtained. The principle involved was that the colon was drawn out through an opening that barely admitted its passage, and that as a result the knuckle of bowel obtained was empty, stretched on its convexity, and could be immediately opened without soiling the wound.

THE PSYCHOLOGY OF THE CRIMINAL.

AT a meeting of the Medico-Legal Society on February 17th, Dr. NATHAN RAW in the chair, a paper was read by Dr. GODFREY CARTER entitled "The psychology of the criminal."

Dr. Carter remarked that a judge had recently observed to a grand jury that he wondered in many cases whether the cause was "uncontrollable impulse," or rather "impulse which ought to be controlled." Such a pronouncement from so high an authority made one realize afresh how complex was the problem of the mentality of the criminal. As a consequence of the war there had been let loose a primitive willingness to fight, to maim, or to kill, which, followed as it was by the mass butchery of the Russian revolution, had led directly to an aftermath of callousness and indifference to the sanctity of human life and morals which were alien to the spirit of our generation. Murders were being committed for causes which formerly would have evoked mild retribution only. As it was, the controlling centres of the brain were the first to give way under disease or stress, allowing the basic passions to reassert themselves and assume control easily. Much crime was only vicious and not the outcome of insanity as they knew it. Analysing the mental states of murderers in cases coming under his personal observation, he asked, Were they genuinely insane—the victims of irresponsible impulse as the result of disease of mind—or were they sane people whose criminal intentions ought to have been, and could have been, controlled? The legal defence of insanity was that the accused, at the time of committing the crime, was suffering from a defect of reason due to disease of mind, so that he did not know the nature and quality of his act, or, if he did know it, then he did not know that what he was doing was wrong. Dr. Carter pointed to cases where the impulse might become uncontrollable from temporarily emotional causes, yet the mind might be free from disease of an organic character, and he cited a case where the accused man told him he "seemed to see red," and so lost all control. This case would be found fairly typical of the majority—a wave of sudden passion, a failure to damp down a wrongful impulse, a reversion to the savage. Society must be protected, and unless overwhelming evidence of definite mental disease were produced there seemed no alternative but to rid the community of those who slew others whilst under impulses which ought to be kept in abeyance. Dr. Carter said he had observed it was almost impossible to secure a conviction for murder where the accused had once been an inmate of an asylum, and he did not consider this was altogether right. It had been said, no doubt with a good deal of truth, that no man was absolutely sane on all subjects at all times. Did they not all know of many most estimable people, level-headed members of society, who had at some time in their lives been subjected to the temporary seclusion of a "mental home," or who ought to have been so? Was this fact to grant immunity from the dread punishment of the law should they ever be indicted for murder? Rather then would he sympathize with those borderland people who just managed to keep outside the walls of detention, yet who were painfully aware of abnormal predisposition and thoughts, and had had to fight hard to keep to the road of approved conduct without falling into the ditch of insanity. He did not think definite insanity was often directly transmitted as such from parent to child, as was congenital idiocy. They knew that heredity was a potential disturbing factor, but nature was a still more powerful factor, working hard to restore mankind to the normal standard of mentality. He did not know that the interests of justice would be damaged if considerations of heredity were excluded altogether in judicial inquiries. For if it could be clearly shown that a man's parents, grandparents, and uncles and aunts, had all been insane, such evidence would afford no proof whatever that the man himself was insane. As a matter of fact, did medical men often find certifiable people the children of similarly afflicted parents? Dr. Carter criticized the form of the verdict "Guilty, but insane," and asked how a person could be at the same time insane and guilty. If insane, the crime was merely a manifestation of the insanity. He referred to a case of infanticide where a mother, badly treated and half starved, had attempted to drown herself and her two children, but where she and one child had been saved. Such a verdict was returned, and the accused woman had been sent to a criminal lunatic asylum. This was a real case of uncontrollable impulse, not due to disease of mind, but to a temporary defect of reason, and he suggested that the verdict in such a case should be, "Not guilty of murder because suffering from temporary insanity at the time of committing the deed." Infanticide by the unmarried domestic class of woman was usually lightly punished, or the women were bound over under the care of philanthropists; it seemed to him that of the two, this class of case gained the most, for here the mother did not wish the child to live. Neither lawyers nor doctors appeared as yet to have reached a satisfactory definition of what constituted criminal responsibility. Some people were liable under great stress to suffer from defects of reason not due to disease of the mind, during which they lost the power of reasonable control over their actions, often with tragic results. Such cases were in a totally different category from those in which, either when "seeing red" or not, an individual put another to a violent death. Murder was the last thing which entered the distracted minds of these women. They decided at last that with so unbearable a lot hitherto, they would rather throw themselves on the mercy of God than on the compassion of mankind, and, in doing so, would take with them their helpless infants, whom by reason of their love they could not leave behind to face neglect and misery. When restored to considered reason a lifelong punishment awaited them in remorse. Was it necessary to brand them also as murderesses and consign them to associate with those of depraved mentality in the wards of a criminal lunatic asylum? The broad question to determine was: Was there a real uncontrollable impulse—a mental defect present which placed the culprit's action beyond his power of control? If it was a case of not exercising due powers of inhibition, control being really possessed by the individual, "impulse which ought to have been controlled" would be the right finding. He really did not consider that to the doctor evidence was of very much value except in cases of obvious delusional insanity of which he might observe indications. The medical evidence as to the mental condition of the accused was very contradictory and unsatisfactory, and he feared often trammelled the judge. The medical witnesses did their best, but he did not think they would ever be able to formulate in black and white an accurate definition of what constituted an insane impulse. He was not sure that the M'Naghten definition, good as it was, could be used in every case, either by judge or medical expert, to decide directly the vexed question: "Was it an uncontrollable impulse or an impulse which ought to have been controlled?"

AT a meeting of the Buxton Medical Research Society held on February 12th Dr. KNYVETT GORDON read a paper on anaemia, with special reference to the clinical value of the examination of blood films. The paper was based on a combined clinical and haematological examination of 1,834 cases of anaemia, and was illustrated with lantern slides by a direct three-colour process and drawings of the different types of blood cell. The speaker emphasized the importance in diagnosis of first excluding the leukaemic group and then the other primary anaemias—namely, pernicious anaemia, and Banti's disease with its allies. The conclusion was drawn that pernicious anaemia was a congenital disease, and that haemolysis was not commonly a cause. Stress was laid on the value of the blood film in distinguishing in secondary anaemias between bacillary and coccal infections, and as a guide to a suitable vaccine in the treatment of the condition. Bacterial infection was described as the cause of the great majority of the cases of secondary anaemia, and the methods of discovering and dealing with the focus were discussed. Details were given of the technique of vaccine therapy, including laboratory tests for pathogenicity of the organisms isolated.

Reviews.

DIGITALIS.

PROFESSOR A. R. CUSHNY in his monograph *The Action and Uses in Medicine of Digitalis and its Allies*[1] gives a clear and critical account, which will be of the very greatest value to the profession, of the present state of knowledge regarding the mode of action of these important drugs.

The book commences with a short summary of the conflicting evidence concerning the nature and number of the active principles present in digitalis. The author suggests that many of the substances that have been given distinctive names are really mixtures of two or more glucosides.

Considerable space is devoted to a consideration of the mode of action of digitalis on the frog's heart. The account is of particular value since it is critical, for the work on this subject is very uneven in quality. The author remarks in one place, "These experiments are chiefly of interest in suggesting that there are limits beyond which the much-enduring frog's heart is unable to beat." He is at pains to distinguish carefully between valid and worthless experiments, and thus is able to give a clear and coherent account of the important fundamental facts that have been ascertained from experiments on the frog.

The evidence derived from mammalian experiments is next considered, and here also the author distinguishes carefully between effects produced by the drugs in therapeutic doses and those which are only to be observed when several multiples of a lethal dose are administered. The experimental section occupies nearly two-thirds of the volume, but the author points out that during the whole nineteenth century our knowledge regarding the therapeutic action of digitalis was at a standstill and that the rapid progress of the last fifteen years has been dependent on the accurate analysis of the mode of action of digitalis, which was gained by animal experiments. As regards the therapeutic use of digitalis, chief attention is devoted to its effects in cases of auricular fibrillation, and a very clear account of this action is given. A cautious attitude is adopted towards the vexed question of the benefit produced by digitalis in heart disease without disorder of rhythm; the conclusion (p. 237) is:

"There is no doubt of the benefit attending the use of digitalis in some of these cases, whilst there is as little question that in others the treatment is valueless; and at present it is not possible to differentiate between these."

The question of the value of digitalis in the treatment of pneumonia is also discussed, and the author concludes that—

"The routine treatment of pneumonia with digitalis is therefore not established as advisable, and the general view is that it should not be given until some special indication is presented."

An interesting account is given of the toxic effects of digitalis, and details are given of the experiment Koppe made on himself. It is particularly interesting, because Koppe took a milligram of digitoxin by mouth without any certain toxic effects, but a dose of 2 milligrams taken four days later nearly produced a fatal result. This shows the unpleasantly narrow margin between the therapeutic and the toxic dose of digitalis.

The final chapter in the book deals with the mode of administration of digitalis and its allies, and details are given of the various intensive methods of treatment that have been introduced in America.

Regarding the choice of preparation, Professor Cushny makes some interesting criticisms of the innumerable proprietary preparations that have been introduced as alternatives to digitalis. He points out that the claim so frequently made that a particular digitalis preparation does not produce cumulative action or nausea must of necessity be unfounded, since any digitalis preparation which does not produce these effects must either be inert or else so weak as to be valueless. He concludes (p. 264):

"These proprietary preparations are often carefully prepared, standardized, and put on the market in attractive forms, so that some of them have been widely used; but none of them is superior to a carefully standardized pharmacopoeial preparation, and all are sold at extravagant prices. In some instances the strength has been found to vary widely, and this is a source of danger."

Professor Cushny has devoted many years of his life to the study of the action of digitalis, and we are indebted to him for much of our present knowledge of this subject. His volume may with reason be considered a masterpiece of its kind, since all aspects of the subject are considered and all are subjected to a shrewd critical judgement based on the author's wide first-hand knowledge of the problems involved.

[1] *The Action and Uses in Medicine of Digitalis and its Allies.* By A. R. Cushny, M.A., M.D., LL.D., F.R.S. London: Longmans, Green and Co. 1925. (Med. 8vo, pp. xi + 303; 77 figures. 18s. net.)

SUNLIGHT AND ULTRA-VIOLET RAYS.

THE healing powers of natural and artificial sunlight are exciting widespread interest at the present time in view of the work of Dr. Rollier in Switzerland and Sir Henry Gauvain and Dr. Leonard Hill in this country, and the two new books on ultra-violet ray therapy here reviewed will probably be welcomed by medical men looking for a concise description of the way to use the various apparatus which generate ultra-violet rays, and what may be expected from them. Dr. FRANCIS HOWARD HUMPHRIS's book is entitled *Artificial Sunlight and its Therapeutic Uses.*[2] It has been written for medical practitioners. The author does not forget that many years have probably elapsed since such readers studied physics, and he explains the scientific basis of light therapy in a clear and simple way. He has a brief chapter—perhaps a little too brief—on apparatus used for generating ultra-violet rays, and the remaining two-thirds of the book are devoted to description of the treatment of disease. Here the different maladies for which light treatment is beneficial are discussed in turn, with a recommendation as to which particular form of apparatus is most suitable for each. The book is set up in an attractive way, and will prove useful to those seeking special information on this subject. Of more general interest is the author's contradiction of the claims of many "ultra-violet ray apparatuses" as used in the "beauty parlours" (p. 25) and his reference to the proposed institution of sun baths in Ken Wood, adjoining Hampstead Heath. Many quotations are scattered throughout the earlier chapters, to which, for the most part, Dr. Humphris attaches no references, only giving the name of the author. Quotations are often an ornament to a book, and to attach references to such as are borrowed from well known or illustrious writers is sometimes unnecessary and might be pedantic; but passages are cited in this book the exact origin of which many readers may wish to know; such a one appears on page 26. Being curious as to the source of certain quotations, we took the trouble to trace one imputed to Dr. Rollier (without chapter or verse) which is made rather much of on page 28:

"Sun and ultra-violet rays bear much the same relation to one another as crude drugs do to their synthetically prepared chemical substitutes."

We found these words eventually in Dr. Rollier's book *Heliotherapy*, but in the section of this book written by Dr. Amstad, the surgeon at Rollier's institution at Leysin. This, therefore, is Amstad's opinion and not Rollier's. A reading of the context makes it questionable whether Dr. Humphris has put this remark to a use with which Amstad would agree. A less important point in terminology arises when Dr. Humphris speaks of ultra-violet rays as antigenic.

"In brief, ultra-violet rays assist the development of antibodies. They are therefore antigenic and capable of destroying bacteria within the body" (p. 51).

The term "antigen" is commonly limited to any substance which, when inoculated into the body, is capable of causing the production of antibodies. Radiation may result in the development of some antigen within the tissues, though whether it acts in this way and what the hypothetical substance is remains undetermined. We should not speak of a holiday at the seaside as an antigen, or even as acting antigenically.

[2] *Artificial Sunlight and its Therapeutic Uses.* By Francis Howard Humphris, M.D.Brux., F.R.C.P.Edin., L.R.C.P., M.R.C.S. London: H. Milford, Oxford University Press. 1924. (Demy 8vo, pp. xiv + 170; 12 figures. 8s. 6d. net.)

To Dr. PERCY HALL's book *Ultra-Violet Rays in the Treatment and Cure of Disease*[3] both Sir HENRY GAUVAIN and Dr. LEONARD HILL have written introductions. Dr. Hall addresses himself not only to medical men, but also to educated members of the laity, particularly such, he observes, as are public-spirited citizens and interested in the health and welfare of the poorer members of the community. The book has been written to encourage the establishment of light departments in hospitals and light clinics in big centres of population. The earlier chapters, on the history of light therapy, the value of sunlight, heliotherapy, artificial light, and ultra-violet radiation, provide interesting reading for everybody. After reviewing the different sources of ultra-violet light, Dr. Hall concludes that the tungsten arc lamp is the handiest and generally most serviceable:

"In effecting a final choice as to the source of ultra-violet radiation to be employed, one can safely decide upon the tungsten arc as being of the widest utility, and of yielding a spectrum which is the richest in amount and variety of ultra-violet emanations."

He mentions, but does not give much detail about, the Finsen lamp, mercury vapour lamp, and other appliances. The remainder of the book discusses the value of ultra-violet radiation in skin diseases, rheumatic disorders, neurasthenia, pulmonary tuberculosis, and catarrhal conditions of the respiratory tract and various other diseases. The whole book can be read from cover to cover in about two hours without any break of interest. Both classes to whom it is addressed will find it an instructive introduction to ultra-violet ray therapy.

INFLAMMATION OF BONES AND JOINTS.

IN the textbooks of a generation ago much space was devoted to the subject of inflammation of bone, yet it is probably true that the student was more often puzzled than informed, and landed in an obscurity from which he rarely emerged. The obscurity still exists to some extent and in some quarters, and the virtue of Professor ELY's book on *Inflammation in Bones and Joints*[4] is that it discards the old notions of "rarefactive osteitis" and "sclerosing osteitis" regarded as entities, and starts afresh on a more rational basis. The changes which occur in the bone tissue itself are probably of a purely passive kind, consisting of absorption or atrophy, production or hypertrophy, and death or necrosis, and they result from the more important and essential changes in the contained marrow. The old distinction between osteitis and osteomyelitis, therefore, has probably no foundation in fact, and there is much to be said in favour of the custom of some recent writers who discard the terms "osteitis" and "periosteitis" altogether, the essential lesion in these processes being a myelitis or osteomyelitis. A similar confusion of ideas was prevalent with regard to the term "arthritis," which was applied not only to lesions strictly confined to the joint, but also to conditions in which the disease was chiefly and primarily a marrow lesion. The term should, as the author points out, be restricted to lesions of the synovial membrane, arthritis and synovitis being regarded as synonymous terms.

The practical application of these views to the group of diseases under consideration greatly simplifies our conceptions, since the two essential lesions involved are clearly distinguished. These terms adequately define the lesions when they occur singly, and it might be supposed that some such term as "myelo-synovitis" would be appropriate for the combined lesions. Professor Ely has, however, hesitated to push his views to their logical conclusion; he states that "the custom is almost universal to describe the chronic arthritides as separate from inflammation in the shafts. This custom has decided merit, for, when the joint is involved, the symptoms of the arthritis usually dominate the picture. Most arthritides are, however, the result of a previously existing myelitis." Hence an incorrect nomenclature is deliberately adopted, in deference to custom. He regards the red marrow of bone as being analogous to lymphoid tissue, and, like it, peculiarly subject to tuberculous infection—a view that goes far to explain both the frequency of its infection and the local incidence of the disease within the bones. Further use is made of the analogy in explaining the beneficial effects of rest and ankylosis on the tuberculous process. In the bones of a joint which has been put out of function by immobilization there occurs a reduction of the lymphoid marrow, which is thus rendered less favourable for the growth of the bacilli. A similar reduction, and even a complete conversion into fatty marrow, has been described by Ollier and Mauclaire as occurring after bony ankylosis, the synovial membrane disappearing and the bone ends assuming more or less the internal structure of the shaft.

From principles based on these views and on the opinion that tuberculosis of the joints is in itself a comparatively harmless disease, and only becomes serious when a secondary infection is added, the author deduces the general lines of treatment to be adopted. For children he advocates conservative treatment in all cases, while for adults he considers that it should be practically always radical, the object being to cause permanent destruction of the joint, rendering it an unsuitable habitation for the bacillus. Professor Ely's work is marked by original and independent thought, and is a valuable contribution to the pathology of the subject.

EXPERIENCES IN SURGERY.

WE have already had occasion to mention a book on practical surgery written by M. VICTOR PAUCHET, and issued in parts. We formed a favourable opinion of it, and are therefore not surprised to find that the book has been translated by Dr. F. R. B. ATKINSON and issued, with a general introduction by Sir CHARLES GORDON-WATSON, in four volumes with the title *Practical Surgery Illustrated*.[5] It is a personal production and does not claim to be a textbook of surgery. The author's method is to illustrate each step of an operation by drawings taken from nature by M. S. du Pret, who made the illustrations for Testut's *Anatomy*.

For the treatment of inguinal hernia he suggests what he calls the "endo-peritoneal method." He opens the peritoneum above the sac and inserts a finger into the sac from within, pulls the structures of the cord off the sac, and invaginates it and brings it through the opening in the peritoneum. In this way there is, he says, very little disturbance of the cord; a portion of the rectus sheath is used to cover it. In appendix abscess he cleans out the abscess cavity with ether and does not search for the appendix. In perforated appendix he believes in multiple drainage. In quiescent appendix he considers invagination of the stump unnecessary. For ventral hernia he employs bronze wire suture for all the structures outside the peritoneum. These are twisted over gauze pads after the skin has been approximated by Michel's clips.

Adenoma of the breast is treated by submammary incision, and the illustrations are so clear as almost to render the text superfluous.

Local or sacral anaesthesia is employed for pile operations. In the ligature method he sutures the pile stumps to the skin. He has a good deal to say about carcinoma of the rectum; his conclusion is that of "four cases applying for treatment, one will be inoperable, two will be operable by the two-stage perineal method, and one by the abdomino-perineal method." The latter he describes fully with the help of excellent illustrations. On the subject of intestinal stasis he is an enthusiastic apostle of Lane. Kinks and bands are fully illustrated, as are the operations for treating them. Gastrectomy is advocated for gastric and pyloric ulcers, and also for jejunal ulcers. Though other methods are also discussed, gastro-enterostomy is not advised in cases of perforated ulcer unless pyloric stenosis is present. In cancer

[3] *Ultra-Violet Rays in the Treatment and Cure of Disease.* By Percy Hall, M.R.C.S.Eng., L.R.C.P.Lond. With introductions by Sir Henry Gauvain, M.A., M.D., M.C.Camb., and Leonard E. Hill, M.B.Lond., F.R.S. London: William Heinemann, Ltd. 1924. (Demy 8vo, pp. xvi + 110; 20 plates. 7s. 6d. net.)

[4] *Inflammation in Bones and Joints.* By L. W. Ely, M.D. Philadelphia and London: J. B. Lippincott Company. 1923. (Med. 8vo, pp. 433; 144 figures. 30s. net.)

[5] *Practical Surgery Illustrated.* By Victor Pauchet. Translated by F. R. B. Atkinson, M.D., C.M.Edin. Univ. With an introduction by Sir Charles Gordon-Watson, C.M.G., F.R.C.S. Vols. I to IV. London: E. Benn, Ltd. 1924. (6½ × 11: Vol. I, pp. xiii + 293, 217 figures; Vol. II, pp. ix + 252, 199 figures; Vol. III, pp. x + 248, 308 figures; Vol. IV, pp. xi + 255, 307 figures. 18s. 6d. per volume.)

of the cervix radium is employed before operation. For carcinoma of the stomach total gastrectomy with jejuno-jejunostomy is described, and the en-Y operation for duodenal ulcer is preferred. In performing colostomy for cancer of the rectum the author brings the colon through the rectus with a half-twist in the hope of obtaining sphincteric control. In the two-stage operation he performs colostomy, inserts radium, and a month later completes the perineal excision.

In Volumes III and IV the author continues in the same strain, and in some places amplifies subjects previously dealt with. In posterior rhizotomy he turns up the spinous processes as a bony flap, opens up the laminae with gouge forceps, and replaces the flap to prevent deformity. The remarks he has to make on the operative treatment of fractures are illustrated by an account of the use of steel bands, devised by Professor Putti, which encircle the bone. On the subject of cancer of the tongue Pauchet is very dogmatic; every lesion not proved innocent should, he says, be treated as malignant, and he regards improvement from antisyphilitic treatment as a dangerous illusion. When the front of the tongue is involved the buccal route is advised, when the posterior half is affected the submaxillary; the jaw is split when the floor of the mouth is encroached upon. The external carotid is invariably tied when the glands are removed.

In gastric ulcer he advocates partial gastrectomy, and has devised a special clamp for this purpose. For duodenal ulcers posterior short-loop gastro-enterostomy is advised, and when the acidity is high, partial gastrectomy. He states that 5 per cent. develop jejunal ulcers, that 25 per cent. are partial cures, and 70 per cent. cures. He believes that the symptoms are due to cholecystitis, appendicitis, or intestinal stasis. When discussing recurring dislocation of the shoulder he advises excision of the redundant capsule and suture of the overlapped margins; the incision is along the mid-axillary line and the approach along the neuro-vascular bundle, which is retracted forwards. Pauchet holds strong views on the formation of gall stones and their relation to the pancreas. He believes that the gall bladder is infected by way of the portal vein, the *Bacillus coli* being eliminated by the liver into the bile; he thinks also that all stones are formed in the gall bladder, which he regards as a mechanical shunt for the bile when the ampulla of Vater becomes blocked, and that in this way it prevents pancreatitis. He does not believe in medical treatment for gall stones, and prefers cholecystectomy to cholecystostomy.

In an opening chapter he describes how a surgical clinic can be established in a provincial centre.

NOTES ON BOOKS.

ALTHOUGH the number of pages in the thirty-fifth edition of *Burdett's Hospitals and Charities*[6] is approximately the same as in the last edition, it contains considerably more information, the size of the page having been increased both in length and width. The statistical tables benefit to a large extent by this change—a most important point, since this year book takes into consideration the whole of the charitable efforts of the British Empire in respect of hospitals and kindred charities. The various financial details and summaries are set out more clearly than has been hitherto possible. Among important subsections added for the first time is one devoted to holiday homes and homes of rest, which will be found under the heading "Convalescent Homes." This list enables a distinction to be made between those homes which provide for patients in need of rest and change of air and others for persons recovering from serious illness; the addition will be found valuable. A list has been made of all the hospitals throughout the world where accommodation is reserved exclusively or specially for British seamen. A new subsection has been added to the section dealing with missionary and religious societies in the form of an index and short description of London, provincial, and Scottish settlements for social work. Under the heading of "African Hospitals" the Gambia hospitals, the hospitals in Tanganyika Territory, and those in Uganda have now separate sections. It is interesting to note that the account of hospitals of South-west Africa has been increased from a single sentence in the last issue to thirteen entries in the present, whilst the lists of hospitals in other parts of Africa have also been greatly enlarged. The considerable progress made lately in contributory schemes receives recognition. The great advance by King Edward's Hospital Fund for London is recorded, and tables are supplied giving the analysis of the receipts and expenditures of this fund and of the League of Mercy since their inception. The directory of London and provincial hospitals, universities, and other institutions has been brought up to date, and the present issue represents a decided advance in value and interest, even over the high standard of its predecessors.

The third edition of *Diseases of Women*,[7] by Ten Teachers, has been issued under the general editorial direction of COMYNS BERKELEY, H. RUSSELL ANDREWS, and J. S. FAIRBAIRN. This valuable book has made a place for itself and little need be said in regard to the present edition, which contains only minor alterations and improvements. The size of the book has not been increased, and we venture to express the hope that in subsequent editions it will not be allowed to grow in bulk. We congratulate the publishers on having reduced the price—a rare phenomenon in these days. The teaching, both from the pathological and clinical sides, represents the authoritative opinion of British gynaecologists in general; the section on operative technique is clearly written and clearly illustrated, and should suffice for the needs of students and practitioners and all save those who are making a specialty of gynaecology.

The monograph on *Josef Skoda*[8] by Professor MAXIMILIAN STERNBERG, which forms the sixth volume of a series of biographies edited by Dr. Max Neuburger, contains a full account of Skoda's activities as pathologist, writer, and lecturer, and a sketch of contemporary medical life in Vienna. Apart from his work on auscultation and percussion for which he is chiefly remembered, Skoda took an active interest in practical hygiene and wrote on such subjects as the macadamizing of roads in the new city park, compulsory vaccination, and especially the water supply of Vienna. A report made by him on medical education contained several new ideas which were not realized until many years later, particularly as regards the creation of an institute for experimental medicine. In spite of his scepticism in therapeutics Skoda had a large consulting practice, which increased still more when he gave up his hospital work and was able to devote himself entirely to his private patients. In private life Skoda does not appear to have been altogether the top-heavy and somewhat inhuman old bachelor described by Garrison; he was generous to the poor, and he deserves special credit for championing the cause of Semmelweis. A bibliography of Skoda's writings and of works written under his influence is given.

A new quarterly medical periodical has appeared with the title of the *British Journal of Venereal Diseases*. It is edited by Lieut.-Colonel L. W. HARRISON and Dr. E. R. T. CLARKSON, and published under the direction of the Council of the Medical Society for the Study of Venereal Diseases. Sir Humphry Rolleston, in an introduction to the first number (January, 1925), remarks on the need for intensive study in attempting any real advance in knowledge, owing to the complexity of modern medicine; he adds that the study of venereal disease deserves to be considered, and has indeed become a legitimate specialty. The existence of venereal disease departments at the hospitals and of venereal clinics in connexion with the Ministry of Health is held fully to justify the appearance of a special journal. It is proposed to cover the whole subject of venereal disease, apart from the important, but thorny, problem of moral considerations. Original articles and critical reviews of recent knowledge will be published, summarizing the most recent research and appealing to general practitioners as well as venereal specialists. Colonel Harrison contributes to the January issue an article on the public health services and venereal diseases; Dr. E. P. Cumberbatch and Dr. C. A. Robinson discuss the use of diathermy in cases of gonococcal infection; Dr. W. J. Tulloch contributes notes on the complement fixation reaction in gonorrhoea; Dr. E. T. Burke considers the administration of bismuth in syphilis; Dr. Svend Lomholt of Copenhagen deals with the pharmacology of bismuth, with reference to its therapeutical employment in syphilis; Dr. R. N. Ironside describes the treatment of general paralysis by malarial inoculation; and Dr. H. C. Semon considers in detail skin affections commonly mistaken for syphilis. There would appear to be a need for such a journal, and the high standard of its first number should commend it very widely.

[6] *Burdett's Hospitals and Charities, 1925.* Founded by Sir Henry Burdett, K.C.B., K.C.V.O. Thirty-fifth year. London: The Scientific Press, Ltd. 1925. (Demy 8vo, pp. lxxx + 1014. 17s. 6d. net.)

[7] *Diseases of Women.* By Ten Teachers. Edited by Comyns Berkeley, H. Russell Andrews, and J. S. Fairbairn. Third edition. London: Edward Arnold and Co. 1924. (Med. 8vo, pp. xi + 641; 215 figures. 24s. net.)

[8] *Josef Skoda.* By Maximilian Sternberg. Vienna: Julius Springer. 1924. (5½ × 8½, pp. 92; 1 plate.)

British Medical Journal.

SATURDAY, FEBRUARY 28TH, 1925.

SIR CLIFFORD ALLBUTT.

IT is too soon yet to attempt to write what the eighteenth century would have called "a character" of Sir Clifford Allbutt. We are too near to him; we feel too vividly the presence of that slight, alert figure, the mobile face, with eyes looking, not through you, but into your mind; often, when seated, leaning forward in his eagerness to grasp the proposition that was being put before him, for he was by no means a man to take anything for granted. Though always kindly and generous, his mind was of the critical cast, and one could watch him turning over for a moment or two what had been put to him in conversation. Sometimes he would reach a judgement quickly and would agree, perhaps with a reservation; sometimes he would quite frankly disagree; and sometimes, after a rather longer pause, he would say, "I am not sure about that, and would like to think it over." It was a great compliment to the younger or lesser men, who could always be quite sure that the idea was not rejected or judgement about it suspended merely because it was new. It was part of the alertness of his mind to be ready always to examine new ideas and to accept the teaching of new facts, but he was not in the least dazzled by newness. His critical faculty awoke at once, and he applied it to his own work or his own theories as readily as to those of others.

As a physician he will probably be remembered for his work on the circulation—the heart, the aorta, and blood pressure. What he did as a young man about the optic disc in relation to general diseases was perhaps even more original, but the whole neurological and ophthalmological world descended upon this new method, and in it his reputation is that of a pioneer. About angina pectoris, heart strain or stress, and high blood pressure it was different; these are still matters of keen dispute; they were in his mind throughout the whole of the second half of his life, and one of his latest public utterances was the speech he made last May after the lecture at the Royal College of Physicians of London in which Professor Wenckebach of Vienna gave his reasons for adhering to Allbutt's original doctrine that angina pectoris was related to the condition of the aorta. He would, we feel pretty sure, have agreed that medicine was a science, with its own data and its own methods. He kept himself well acquainted with the advances of physiology, and made free use of them in his writings and addresses, but as sidelights. He based himself on bedside observation confirmed or corrected by pathology.

Allbutt was very human. Many as were his distinctions, great as he must have known his reputation to be, there was never the smallest trace of pomposity. He was ever the friend of the general practitioner, whose qualities, trials, and difficulties he got to know well during his time in Leeds, when he journeyed far and wide in West Yorkshire, into its teeming industrial towns and into its rugged valleys, where in a harsh climate a hardy peasantry wrings a living from an unkindly soil. He was therefore, in this respect as in every other, well qualified to be President of the British Medical Association. About this all that need be said is well said by Dr. Brackenbury in the few moving sentences he has contributed to our biographical notice. Allbutt was a scholar and never let his knowledge of Greek and Latin writers rust. Of this his book on *Greek Medicine in Rome*, published in 1921, is sufficient evidence, but his interest in science was lively and continuous. In this he was like the great men of the later renaissance. He was a great physician and a very perfect gentleman.

THE SYMPATHETIC INNERVATION OF STRIATED MUSCLE.

IT is fortunate that Professor Elliot Smith was willing to undertake the preparation, delivery, and publication of the lectures to have been given by the late Professor J. I. Hunter, the tragedy of whose death we must lament the more as we read of the far-reaching influences of his brief life of research. Professor Elliot Smith has not only marshalled in orderly sequence all the numerous aspects of Hunter's investigations which shed light upon his fundamental thesis with regard to the sympathetic innervation of skeletal muscle, but has indicated the wide effects of these researches upon neurology, and has suggested how they will probably harmonize many views which hitherto have appeared to be discordant.

The careful investigations of Professor Kulchitsky, whose death we regretfully reported only a fortnight ago, suggested the earlier experiments which led to the discoveries reported in the lectures. Kulchitsky demonstrated in 1922 that medullated and non-medullated nerve fibres never terminate in the same muscle fibre. Hunter and his co-workers have confirmed this, and overwhelming evidence has been advanced from various sources in support of the belief that there are two kinds of skeletal muscle—the one innervated by somatic medullated nerves, and the other supplied by non-medullated sympathetic fibres. The experimental and clinical evidence demonstrating the different and distinct functions of the two kinds of striated muscle is equally convincing. In addition to the knowledge of the important effects of sympathetic denervation upon the spinal and decerebrate animal, which was conveyed in recent papers by Hunter and Royle, we are now presented with a lucid account of the most illuminating experiments upon birds. For anatomical reasons, which are set out in the lectures, the bird's wing offers a unique opportunity for studying the postural activity of voluntary muscle, and for determining the influence of the somatic and sympathetic nervous supply individually. These experiments, and particularly those in which "contractile" and "plastic" tone were dissociated so clearly, must dispel any doubt or uncertainty which previously existed in the minds of people who were only aware of the earlier experiments. The accurate descriptions of the results of these experiments cause the essential and distinguishing characteristics of contractile and plastic tone to stand out in bold relief, and demonstrate how so many previous workers in this field have been misled by an obsession regarding the contractile element of tone.

The researches of Hunter and his co-workers will do much to eradicate widespread misconceptions about tone, and will assist a larger proportion of the profession to appreciate the real significance of the fundamental doctrines arising out of the discoveries of Sherrington. It is absolutely essential for every surgeon to have a clear vision of the two elements of

tone which are together responsible for the production and maintenance of posture before he can attempt to investigate a patient suffering from muscular rigidity. Unless he has a correct conception of the meaning of contractile and plastic tone, it is impossible for him to determine the cause for the rigidity and decide whether there is an excess of one or the other or both elements. Both the experimental and clinical evidence prove—and this must be insisted upon most emphatically—that sympathetic ramisection can only have any beneficial effect when there is an excess of plastic tone. It has been demonstrated that posture alone is not an indication for sympathetic ramisection, and that posture may be misleading. On the other hand, the presence of the "lengthening and shortening reactions" of Sherrington, and the slowness in execution of the tendon reflexes, are important indications for the operation; it will, of course, be understood that benefit can only be expected in patients who retain considerable voluntary power, much of which may be hampered seriously by the increased plastic tone. Failure to determine the presence of an excess of plastic tone and voluntary control must inevitably lead to disappointing results, and may thus bring unfair discredit upon this valuable work. It is probable that this may threaten the progress and future development of this work more than the risks of failure from faulty technique and neglect to cut the appropriate sympathetic rami, since the latter is a straightforward anatomical and surgical problem, whereas the former demands very considerable neurological experience, training, and foresight. Quite formidable difficulties are to be encountered in both cervical and lumbar ramisection, but Royle has presented a very complete account of both operations, and has devised several advantageous manœuvres to surmount the most serious difficulties.

It has been found that even in the most suitable patients the effect of the ramisection upon plastic tone is quite frequently not manifested to any extent until some days or even weeks after the operation. Allusions are made to comparable conditions in some of the experiments, and in this connexion it is of considerable interest to remember that the most striking effect upon decerebrate rigidity was in that case where the longest interval had intervened between sympathetic denervation and the decerebration. It is not easy to see why the "fixing" fibres should slowly lose this characteristic function, and Hunter and his co-workers have as yet been unable to advance an adequate explanation for it. The analogy with smooth muscle is a fascinating suggestion, but, as is stated in the lectures, there are some very serious objections to it. It is one of the several problems which are being vigorously investigated further, and it is possible that its solution may add further knowledge of considerable importance. The delay in the effect of the operation upon plastic tone, and the persistence of the effects for long periods after ramisection in cases recorded by Royle, refute the suggestion that the beneficial results are solely due to vaso-dilatation, since the vasomotor changes are most marked immediately after sympathetic denervation and diminish or disappear later. The investigations which have been carried out to determine the reflex arcs concerned in maintaining the two elements of tone will be studied with the utmost interest. It is to be hoped that the publication of these researches upon the control of tone by the brain will in particular stimulate clinical and experimental investigation, so that this most brilliant work inspired by Hunter may be developed further and completed—it is a duty we owe to his memory.

ON GALL STONES AND ON ACIDOSIS.

MANY points of great interest are raised by Sir Berkeley Moynihan in the thoughtful and informing address with which this issue opens. No one has done more than he to elucidate the problems which gall-bladder pathology has set us, and in his present paper he is able to advance a little further. He has always been an upholder of the theory of cholecystitis as an entity, regarding gall stones as a necessary corollary of the later stages of the disease. That a gall stone cannot come into being in a moment is, of course, sufficiently obvious. Our knowledge of its precise method of development is still most incomplete, but that a period of profound change in the gall-bladder wall must precede the formation of a stone is certain. It is also certain that this diseased gall bladder may often give rise to symptoms before stones are present—that "acalculous cholecystitis" is a definite entity, and should be treated by removal of the offending organ. Yet there are many surgeons who, having opened the abdomen in the confident expectation of finding gall stones, and, being disappointed, retreat with perhaps a prophylactic appendectomy as a sort of rearguard action. In spite of a most clear clinical history of biliary trouble, they feel that they have been mistaken in their diagnosis when no stones are found. Much depends in these cases on the appearance of the gall bladder, for the changes occurring when disease processes exist are now well known. It is noteworthy that a sterile culture made from aspirated bile (whether at operation by needle puncture or by the duodenal tube beforehand) is not an absolute criterion of normality. Sir Berkeley gives some statistics of the results of cultures taken from the different parts of the gall-bladder wall. These would have been even more instructive had some figures been added relative to the finding of stones in these cases and the bacteriology of their contents. They show, however, that *Bacillus coli* is the commonest infecting agent. The interest of this observation lies, as the author points out, in the frequency of gall stones in women on the one hand, and their proneness to urinary infections with this organism on the other. It would be interesting to know whether the colon bacillus produces an increase in the cholesterol content of the blood. Such an increase is known to occur in infections by *B. typhosus*.

This leads us to a portion of the address which is of outstanding importance—namely, the estimations of blood cholesterol which have been carried out at Leeds. In 65 per cent. of gall-bladder cases hypercholesterolaemia was found, whilst in another 23 per cent. the figure was "high normal." The reverse findings were no less important, for a low figure (below 0.133 per cent.) was present in only 2 per cent. of the gall-bladder cases, whilst such a reading was not uncommon in cases of gastric and duodenal ulcer. These results seem to us to mark another milestone on our way to a complete understanding of gall-stone pathology. For it is known that the blood cholesterol concentration rises in pregnancy and during menstruation. It is also known that cultures of the colon bacillus will precipitate cholesterol from the bile *in vitro*. It appears that we are within a measurable distance of being able to piece together the story of gall stones.

Other points of importance are raised in the course of the paper. Of these the most urgent for note at the moment is the section on the treatment of acidosis or ketosis. Sir Berkeley pays tribute to Dr. Thalhimer of Milwaukee, who apparently first tried the simul-

taneous injection of glucose and insulin as a remedial measure for this distressing post-operative malady. Dr. Lilian Farrar of the New York Women's Hospital had published (in 1921) an account of the value of intravenous injection of gum-saline-glucose in preventing and combating ketosis, particularly after long operations. She showed that the range of combining power of carbon dioxide in the blood of women is less than that of men, the danger point being thus sooner reached; this no doubt accounts for the greater tendency of the female to develop ketosis. But it has been found that to run glucose into the veins may not be enough. Dr. Thalhimer's first case was one in which supravaginal hysterectomy had been performed for fibroids; ketosis developed, and 500 c.cm. of 5 per cent. glucose was administered intravenously without effect; 600 c.cm. of the same solution was then given together with 10 units of insulin, and the picture was entirely altered; within a period measured in hours the danger mark had been passed. Most surgeons give glucose by rectum after severe operations, but its absorption by the bowel is uncertain. In a child at least it is often insufficient to prevent the appearance of diacetic acid in the urine, and when such cases recover, as they often do, it may well be that the rectal glucose has really had little influence. Subcutaneously glucose is irritating, and cannot be given in the large amounts necessary without fear of sloughing. On the other hand, it is not easy to sterilize, though fortunately the blood is usually well able to look after itself. In the combined use of glucose and insulin we seem to have a method of treating acidosis more hopeful than any which has gone before, though experience is needed to standardize its application.

THE EVIDENCE TO THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.

THE draft Memorandum of Evidence proposed to be given by the British Medical Association before the Royal Commission on National Health Insurance, which appeared in the SUPPLEMENT of January 3rd, has been considered by local meetings of the profession throughout the length and breadth of Great Britain. The views of some 200 such meetings upon the questions submitted with respect to the more important matters dealt with in the Memorandum have been considered by a joint meeting of the Insurance Acts and Royal Commission Committees of the Association on February 5th, and by the Council on February 18th. In effect the views of the local meetings show general agreement with the draft Memorandum of Evidence, and the amendments made by the Council, after considering the various opinions expressed, are designed to give emphasis and do not in the main involve any alterations of substance. The Memorandum as revised is printed in this week's SUPPLEMENT.

For the assistance of readers we propose to summarize quite shortly the general purport of the revised document as it now stands for final consideration before it is submitted to the Royal Commission on behalf of the Association. This summary must not be taken as in any way official. It is intended to serve only as a guide to one who has not yet read the document with the attention its importance demands. We shall then indicate for purposes of comparison the principal changes that have been made.

After the preamble in Part I, it is declared in the early paragraphs of Part II that a National Insurance scheme is not necessarily the best means of promoting the national health, for no fewer than seven other possibilities would be likely to produce even more satisfactory results; that once a National Health Insurance scheme is decided upon it should have regard to the maintenance of health and prevention of disease, and not merely be concerned with the alleviation or cure of morbid conditions after they have arisen, and that consequently the existing machinery and medical personnel of the public health service should be brought into closest possible touch with the scheme; and that the measure of success which has attended the experiment of the provision of medical benefit under the National Health Insurance Acts has by general agreement sufficed to justify the profession uniting to ensure the continuance and improvement of an insurance system. At this point the advantages and disadvantages of the present insurance system are set out. The five fundamental principles of any National Health Insurance scheme are stated. Next follows a section on the persons to be provided for. In the next section, on the extent of the provision to be made, the Memorandum urges that, besides the general practitioner service, there should be complete arrangements for consultant and specialist advice and treatment, full laboratory facilities for clinical purposes, residential institutional treatment so far as compatible with present limited accommodation, dental advice and treatment, such ancillary help as can be given by nurses and masseurs, and an ambulance service—all equally available to every insured person. These additional services should as a rule be available only upon the recommendation of the insured person's general practitioner. It is urged further that, besides a cash maternity benefit, there ought to be a complete maternity service for insured women and for the wives of insured men, comprising medical examination (not compulsory, of course) and supervision during pregnancy, attendance by a midwife during normal labour and the puerperal period, and attendance by the practitioner of choice when necessary during the puerperal period and pregnancy, with access to a consultant and specialist service.

The next section deals with Regulations and Terms of Service. It opens with a declaration that the free choice of doctor now obtaining provides facilities for abolishing all minor complaints by insured person or practitioner. It urges that the insured person should be required to choose his doctor before illness arises and to prove his title to benefit or be liable to a penalty or the payment of a fee; the practitioner on his side being subject to penalty if he wilfully charges a fee for any service within his contract or if his general conduct is detrimental to the interests of the service. It holds that a practitioner should not be liable to complaint for any honestly made statements in records or reports or certificates, but that refusal to keep records or make reports or furnish certificates on proper occasions, and wilful false statements, should lay him open to serious official action. It urges that all complaints against a practitioner should be sent in the first instance to the chairman of the Local Medical Committee and the chief administrative medical officer of the local authority, and that an effort should be made to settle the matter by agreement between the parties; that all questions of general conduct and of false certification should be reported upon in the first instance by the Local Medical Committee; that the practitioner should have a right of appeal to the Courts, not only on the ground of improper procedure, but because the penalty is out of proportion to the offence; and—a most important point, in our view—that no practitioner ought to be

removed from the panel without the right of appeal to a central professional committee, nor removed except on the advice of such committee.

The last two sections deal with administration and remuneration. Here the Association urges that the administration of cash benefits should be separated from medical benefit, and the latter linked up with all other local health services under an *ad hoc* local authority or a statutory committee representative of all interests, with a chief administrative medical officer and a statutory local medical committee. It declares that the remuneration of the profession should be settled centrally on its merits by negotiation between the Ministry of Health and a central negotiating body; that the general practitioner service should be remunerated by capitation fee, and the consultant and specialist service according to a tariff; that the profession should be completely assured that the calculation of the Central Practitioners' Fund and its division between areas is as nearly as possible exact; that, as a matter of principle, insurance remuneration ought to compare not unfavourably with what is earned in private practice of a corresponding kind; and that the present capitation fee of 9s. is still too low, while the additional grant to rural practitioners needs reconsideration.

We propose now briefly to indicate for purposes of comparison the changes of substance that have been made.

Part I is entirely new, and is intended to make clear to the Royal Commission the fact that the Association is in a position to voice the opinions of the medical profession of the country in this matter. Details are given of the steps taken by the Association in order to secure that every registered practitioner in Great Britain has been afforded an opportunity of forming an opinion upon the Evidence and of making known his views thereon to his fellow practitioners.

Paragraphs 1 to 9 of Part II remain unchanged. In paragraphs 10 and 11 minor corrections only have been made. Paragraph 12 consists of the first part of the earlier paragraph bearing that number amplified to make clear the Association's view that provision for medical advice and treatment for certain of those persons comprised in the second and third groups, referred to in paragraph 11 (workers not under a contract of service but in an economic position like that of present insured persons and those economically dependent upon such persons), should be by way of a family doctor with free choice, rather than by State-paid or rate-paid medical officers or by the establishment of treatment clinics; and that similarly the same conditions should be observed in any provision made for the fourth group—namely, the destitute. Paragraph 13 brings together the second part of old paragraph 13 and the first sentence of old paragraph 14, amended by drawing attention to the body of opinion in the profession which doubts the possibility of including dependants of the poorly paid earners, and the equally large body of opinion as to the urgent need for medical attendance upon the same class of dependants. Here it should be observed that the Memorandum of Evidence is emphatically against any suggestion of admitting all dependants, and indicates the considerable difficulties that might arise in the way of admitting dependants of the poorer insured, though it is in favour of doing this if it can be managed, subject to certain conditions. Around this matter there has been wide divergence of opinion, and it is important to note the terms in which the controversial point is settled. The next four paragraphs have been recast in form, but not in substance, with the object of putting certain points more clearly and forcibly. To paragraph 18 has been added a sentence making quite plain that the interests of existing medical officers shall not be allowed to suffer as a result of any change. Paragraphs 19 to 27 remain as they were. Paragraph 28 has been amended so as to make clear that any change does not mean the immediate abolition of appointments of whole-time tuberculosis and venereal disease medical officers.

Paragraph 29, which deals with maternity work, has also been amended in three directions. The second sentence now includes words which place it beyond doubt that the maternity scheme referred to shall only apply to insured women and the wives of insured men. Further conditions have been added which the Association holds must be observed if any maternity scheme is included under the Insurance Acts—namely, (*a*) that any insurance practitioner must be free to undertake or decline this work without in any way affecting his interests otherwise, and (*b*) that any complaint as to treatment must be referred to a solely professional committee on which the local administrative authority should be represented by its medical officers. Thirdly, it is stated plainly that any registered practitioner must be at liberty to place his or her name upon the list for maternity purposes. In order to clear up some misunderstandings arising out of this paragraph, it may be well to point out that medical supervision of any woman during pregnancy means that the medical practitioner undertaking the work would be responsible for the general supervision of the health of the patient during pregnancy. Except for a few verbal amendments, the remaining paragraphs of the document and its appendices are as in the original draft Memorandum.

MEDICAL ASPECTS OF HOLIDAYS.

SIR HUMPHRY ROLLESTON, Bart., President of the Royal College of Physicians of London, read, on February 20th, an interesting paper before the Liverpool Medical Institution on some medical aspects of holidays. He touched historically on the evolution of the modern holiday from the holy days and saints' days of bygone generations. Holidays, he said, were essential to the well-being of mankind, and as in the individual's life the law of fluctuation between complete activity and complete rest was physiologically necessary, so similarly, in the stress and strain of life, a diastolic period was needed wherein the organism might be recreated physically and mentally. It had, indeed, been said that overwork was no more meritorious than overeating or other form of excess. He mentioned the lives of Sir James Paget and Sir Henry Holland. The former did without a holiday for fifteen years during his hard struggle as a young surgeon-pathologist. The latter for nearly sixty years spent every year two months in travel. In both men the span of life was the same. As years increased the zest for holidays became less keen. Inertia and a clinging to home comforts took the place of the keenness of youth for change and new experiences. Some medical men seemed to keep well on no holidays at all, and relied on walking exercise to keep them fit for their work. On the other hand, many holidays had been beneficial in warding off the collapse of a medical man who had been too preoccupied to take one until a warning had aroused him to the importance of recreation. Sir Humphry proceeded to consider two different aspects of holidays—first, that of recreation, and secondly, that of rest and repair. The holiday should be in essence a complete change from the daily routine, and naturally would depend largely on

temperament and taste. A well arranged week-end habit, involving bodily and mental ease, might obviate a prolonged holiday of six to eight weeks. On the other hand, a Continental holiday well planned had the great advantage of removing effectively from the intended recipient calls, consultations, and certificates. Such holidays were educative and pleasurable, and when taken in a leisurely way were of inestimable benefit. Medical congresses were in this respect of value, and corrective in preventing an all too common tendency to insularity in our ideas and thoughts. Holidays might fail if judicious preparation were wanting, especially in those who missed too much the comforts and amenities of their home life, by suddenly embarking on strenuous physical exertion. He mentioned "diseases due to holidays," and divided them into two—(1) those while actually away from home, and (2) those arising after return but due to infection acquired while on holiday or on the return journey (for example, in sleeping cars). Apparently acquired immunity to microbic infection runs the risk of being lost after a long holiday, and Sir James Paget was of that opinion. In advising patients about the health resort where holidays should be taken, Sir Humphry thought that much more careful consideration should be given to each case, and mental and physical factors should be taken into account. He cited the late Sir Hermann Weber, who paid particular attention to hydrology, climatology, and balneology in the important matter of holidays for his patients. Several members spoke and gave their own experience of holidays, supporting the views expressed by the lecturer. The President, Mr. R. C. Dun, expressed on behalf of the members the pleasure they had in listening to the paper and the value of the suggestions it contained.

ON VARIATION OF BACTERIA.

DR. BERGSTRAND of Stockholm has published, in English, in *Acta Pathologica et Microbiologica Scandinavica*, vol. i, Fasc. 2, 1924, an interesting and important article on variations of bacteria. He shows from his observations that an original culture of *Bacillus coli* contained a motile and a non-motile variety; the latter soon formed varieties, but the former only after a fairly long interval. Photomicrographs are given of varieties appearing in the form of secondary colonies on agar plates, implanted from pure cultures of the motile as well as of the non-motile type; the latter were the more numerous. Not only did the form and colour of the varieties and the morphology of the separate micro-organisms vary, but also the biological characters—for example, the power of producing mucus and fermenting sugars. Serological characters have been considered most stable and specific, and Bergstrand gives a summary of the important investigations of Weil on the agglutination of a *proteus* strain X by serum of typhoid. "If we did not know," says Weil, "that the strains (of *proteus*) originated from one single cell we could not believe them to be identical, at most we might suppose that they were related, so serologically different are they." Weil's co-workers showed also that bacteria belonging to the typhoid, paratyphoid-enteritidis, and dysentery groups behave in a similar manner. The discovery of the Twort-d'Herelle phenomenon showed that all bacteria exposed to a lytic agent actively give rise to varieties. Bergstrand refers to the investigations of Hansen on the varieties occurring from an absolutely pure culture of yeast, and concludes "that everything now goes to show that bacteria and yeast behave in an identical manner." The modifications occurring in bacteria are of great importance, for they may afford a solution of many problems concerning the spread and changing character of epidemics. We see that in these beginnings of life mutation and evolution are constantly occurring.

THE OPIUM CONFERENCES AT GENEVA.

THE conferences called by the League of Nations to consider certain aspects of the traffic in opium and dangerous drugs in the light of the International Convention signed at the Hague in 1912 have at last terminated their labours. The two conferences or their committees have been more or less continuously in session since November last. The first and smaller conference, representative of those countries only which produce opium, at first prepared a draft agreement which was not signed by any of the delegations except that of India. It finally prepared a convention and protocol which were signed on February 11th by all the delegates except the Chinese. It provides for Governmental control of opium, the cessation of opium farming, the prohibition of sale to minors, a reduction of the number of retail shops for sale of the drug, and measures for stopping illicit traffic. The suppression of the export trade in opium for smoking, which the Hague Convention of 1912 sought to prohibit at once or as soon as possible, is to take effect within fifteen years after the League of Nations is satisfied that smuggling shall have been effectively stopped. The Japanese delegate, Mr. Sugimura, criticized the suspensory character of the proposal, and expressed the opinion that the withdrawal of China rendered its operation very difficult. The second and larger conference, which comprised delegates from forty-one States at its commencement, held its final session on February 19th, when a convention and protocol representing the outcome of its labours were signed. These dealt with the means for regulating the trade in dangerous drugs. Unfortunately the delegations of the United States and China withdrew from the later sessions of the second conference, and for the present, at any rate, they are not parties to the agreements arrived at. M. Zahle, the chairman of the second conference, in reviewing its work, said it had been "the most difficult in the history of the League," and that it "could not boast of having reached complete success." The new convention is intended to implement the Hague Convention of 1912, and to furnish machinery for giving effect to its provisions. A permanent Central Control Board is to be set up consisting of eight persons appointed by the Council of the League, the United States, and Germany. This board is to collect information as to the amount of drugs required for medical and scientific purposes in each country for internal consumption, and also as to the raw materials imported, the amount of drugs manufactured, and the stocks in hand. If excess of stock is proved export to such country will be suspended. Import and export of the drugs are to be effected only under Government certificates, and steps are to be taken to put down contraband trade. The convention is not to come into force until it has been ratified by ten Powers, including seven of the States who nominate the central board, and two must be permanent members of the Council of the League.

BOARDING-SCHOOL FOOD.

THE Home Office has issued a most instructive pamphlet entitled *Some Problems of Feeding in Home Office Schools*.[1] It should make a wide appeal to those who have the care of children in resident schools, whether private or under some authority. The problem is the same in all. It is now evident that a diet table based upon calorie values alone is not sufficient. Our conception is widened to include significant though less defined constituents of food. The importance of a practical application of the known facts of dietary in regard to children cannot be too strongly emphasized. Proper feeding plays an essential part in the production of a fit and efficient race. In a school where the children reside for long periods, practi-

[1] H.M. Stationery Office, 1924, pp. 12. Price 3d.

cally without holidays, as in the Home Office schools, the feeding arrangements must be arranged with particular care. The pamphlet is written by Dr. G. H. Culverwell, medical inspector of the Children's Branch, Home Office, and is based upon a paper read by him at the triennial Conference of Managers and Superintendents of Preventive and Reformatory Institutions in Glasgow last June. He deals with the "growth impulse" and the power that can be exercised over it; the need for the recognition of individual variations; the need for variety, and especially the avoidance of anything that will bring about a rotation of meals the sequence of which will be known to the children: "We should never be satisfied with an arrangement by which the same meals recur monotonously on the same day of each week, nor with one in which the particular first course is always followed by the same pudding. A rota of dinners covering at least two weeks is very desirable, and even then it is well to provide for the insertion at intervals of a surprise meal of some food which cannot ordinarily be supplied." Stress is laid upon skilful cooking. The balance of food as determined by vitamin selection is very clearly set out, and will be understood by the lay reader; it is put in such fashion that its importance cannot be missed. Finally, there is a summary, which might well be printed in large type, framed, and hung in the office of every school steward; it is as follows: "Care is necessary to meet the food needs of the individual child. Try to secure the free supply of bread and fat. Try to include in your dietary a full supply of readily assimilable protein food. Include all the milk you can afford. Regard a failure in the fresh vegetable supply much as you would a failure in the school water supply. If you cannot get fresh vegetables, give oranges and increase the dripping. Bear in mind that dried pulses cannot take the place of fresh vegetables. Avoid overcooking. Never forget that bread, margarine, lard, rice, and tinned meat will not help with your vitamin supply. If any number of the children in your school are not making the physical progress that they should, make certain the fault is not with the dietary."

INFLUENZA.

THE deaths from influenza in the great towns in England increased last week from 291 to 354, in London from 76 to 92. Six cities other than London recorded 10 or more deaths—namely, Birmingham (10), Liverpool (10), Manchester (18), Salford (10), Rochdale (11), Leeds (12). Notifications of primary pneumonia were less numerous—namely, 1,742 (1,778 in the previous week); and the epidemic appears to be waning in the North, although in the South it is still perhaps not at its height. Last week's increase of deaths was not, however, so large as might have been anticipated, and in general the disease continues to be mild. It is satisfactory to find from the bulletins, the issue of which has now been suspended, that the King is making a slow if sure recovery, although at the time of writing convalescence has not been established. The attack of influenza from which His Majesty suffered was at the onset somewhat severe, and the bronchitis by which it was complicated extended to the bases of the lungs—a form of the malady which is apt to be tedious and resistant. The King's medical advisers have recommended, in order to secure complete restoration of health and fitness, that when the stage of convalescence has been reached His Majesty should proceed to the South of Europe and cruise in his yacht for a few weeks. His Majesty will probably accept this advice without reluctance, for since his days in the Royal Navy he has retained his love of the sea, as is shown by his keenness as a racing yachtsman. It is announced that the royal steam yacht *Victoria and Albert*, which is at Portsmouth, will be ready to sail at short notice to meet His Majesty at a Riviera port.

THE CARE OF CRIPPLES.

WE owe to Mr. W. A. Cochrane, assistant surgeon to the Edinburgh Royal Infirmary, an apology for an unfortunate confusion which arose in the notice of the *Cripples' Journal* for January published on February 21st (p. 376). That issue contained an article on crippled children in Scotland by the Rev. T. Ratcliffe Barnett, to which Mr. Cochrane added an appendix. It was Mr. Ratcliffe Barnett, and not Mr. Cochrane, who confessed that it was during the war he learnt the first meaning of the word "orthopaedic." The attribution of so unlikely an opinion to Mr. Cochrane ought to have been observed before the paragraph was printed; even Homer sometimes nodded, and an ordinary everyday editor may hope to be forgiven an occasional lapse. The point Mr. Cochrane sought to enforce was that, though the experience of past years has gone far to determine the value of particular methods for securing the welfare of crippled children, yet, if the cripple is ever to become an economic asset, organization will be necessary to make certain of continuity of supervision and after-treatment all through the growing period of the child. In severe cases, he said, there must be institutional care, so that quite apart from removing the physical handicap the educational and vocational training of the crippled child may go on. The people themselves, he went on to say, must be educated about the crippling disabilities of the children in their homes. Not only must the parents be induced to take advantage of the resources even now available, but the public must be stimulated to realize its responsibilities. He referred to the colossal scheme for the care of crippled children in America, which has resulted in the system of Shriners' Hospitals within the last two years. After preliminary negotiations among a few individuals there sprung up a national scheme for the treatment of cripples which now embraces the whole of America, and has a hospital as far west as Honolulu. He made reference also to what is now being done in England through what is commonly called the Shropshire organization, which is rapidly spreading to other parts of the country. Mr. Cochrane appealed to Scotland to do at least as well, and we do not doubt that his appeal will meet with a generous response.

SCIENTIFIC HISTORY.

SCIENTIFIC inventions have a certain fascination for the minds of most people. It is never difficult to get an audience to listen, at any rate for a few minutes, to a description of a new machine for digging coal, a new type of sailing ship, a new disease, or a new helicopter. Newspaper proprietors are well acquainted with this public thirst for elementary scientific knowledge, and they cater for it generously, serving up the discovery in an attractive little article, accompanied by a picture on the back page. But popular curiosity about scientific things is quickly set at rest, and most people are content with a sentence or two of explanation. Ordinary people continue to use the telephone, to "listen in" with wireless, to enjoy electric light, and to travel about rapidly, with little if any accurate knowledge of the discoveries and scientific principles on which these conveniences depend. This ignorance may not persist in the future, because children will learn about scientific discoveries at school. It is interesting to speculate on the way in which scientific discoveries may alter the plan of teaching the school curriculum. Of course, physics will have to be taught in a different way, and be made more interesting by its practical application to familiar things. The method of teaching history is likely to be changed also. Chapters in history books are no longer divided by the deaths of kings, or even by battles and peace treaties. In the history books of the future a chapter may begin with the discovery of the steam engine, another may date from

the first successful aeroplane flight, another from the discovery of microbes, another, perhaps, from the synthetic manufacture of gold. This train of thought has been suggested to us by a recent book by Dr. Franklin Harris of Brigham Young University, entitled *Scientific Research and Human Welfare*.[1] It is a history book of scientific discovery. Beginning with health, the author describes the discovery of causes of disease, the development of painless surgery, the story of x rays, and the successful search for specific remedies. In a section on communication he gives the history of the telegraph, the telephone, and wireless. Succeeding sections deal with discoveries in transportation, illumination, agriculture, engineering, mining, and manufacture. This ambitious programme is covered in about 370 pages, and the book ends with a chronology of scientific discoveries extending from 600 B.C., when the Greeks first learnt how to extract iron and the precious metals, to A.D. 1922, when the African sleeping sickness remedy, Bayer 205, was discovered. It must have been a great labour to collect together all the information, for the book is a veritable encyclopaedia, and ordinary readers will be bewildered by the enormous number of facts they can never hope to remember. But it would do a great deal of good if it made the general public realize how much comfort and convenience they owe to scientific research.

ANTIQUE MICROSCOPES.

SALES by auction have a fascination for certain people, apart from the value or beauty of the articles offered for sale. No doubt those habitual frequenters of Christie's who never bid find pleasure or excitement in watching a keen contest between rival buyers, and their pleasure is akin to that experienced by the spectators of a race or any other competition. Of all London auction rooms Stevens's may be reckoned one of the most attractive. Although it specializes in scientific instruments, its activities are by no means confined to them. At the sale on February 17th the antique microscopes were cheek by jowl with the bulbs and evergreen shrubs which lingered from the sale of the previous day, and we have known a parcel of hams to figure in the same catalogue as photographic lenses and other optical instruments and the most intimate personal effects. The genial presence of the veteran auctioneer who has occupied the rostrum for more than sixty years adds the finishing touch to the scene, and embodies the *genius loci*. Here the antique microscopes to which reference was made in our issue of February 14th were sold last week. Some high prices were paid, one lot—a large ornate silver instrument—fetching £360. An original modification of the Hooke microscope dating from the last quarter of the seventeenth century fetched £160. The auctioneer asserted this to be oldest microscope known, but it does not seem at all certain that it was made by or for Hooke himself. Other lots fetched good prices. One of the smallest but most perfect instruments in the sale—a tiny compound microscope by an Italian maker—went for £45. It is to be hoped that some of the best lots have been secured for our museums, for at present the national collections are not rich in this respect. In the Science Museum at South Kensington there is, it is true, a collection which, though small, is representative, but the majority, if not all, of the exhibits are only lent, and might be removed at any time. Although doubtless most of these instruments were used more for amusement than for scientific research, they are none the less of interest as the types from which scientific modern microscopes were developed. The dissecting microscopes of Lieberkühn's pattern, which really were used for anatomical and physiological purposes, seem, however, to have left no modern descendants. These—one of them dating from the middle of the eighteenth century fetched £12—look at first sight like anything rather than microscopes. It has been stated in the press that Sir Frank Crisp had frequently expressed his intention to present his collection to the Science Museum at South Kensington. We judge from the comments made on this statement by Dr. R. T. Gunther in a letter to *Nature* that Sir Frank Crisp did not make up his mind as to the disposal of his collection, although it is quite clear that he wished it to be made of use in the preparation of a comprehensive history of the microscope. Its dispersal is all the more grievous a calamity because, as Dr. Gunther tells us, "many parts of the instruments have got mixed, that historic examples have been divorced from their history," and "that the collection has been distributed without having been properly catalogued." In this connexion it should be noted that a loose-leaved illustrated catalogue, which was stated to contain voluminous notes and descriptions of only the more modern part of the collection, formed Lot 175 in the sale and fetched £9.

[1] *Scientific Research and Human Welfare.* By Franklin Stewart Harris, Ph.D., with the collaboration of Newbern I. Butt, B.S. New York: The Macmillan Company. 1924. (Post 8vo, pp. 406. 12s. net.)

IODINE FOR INTERNAL USE.

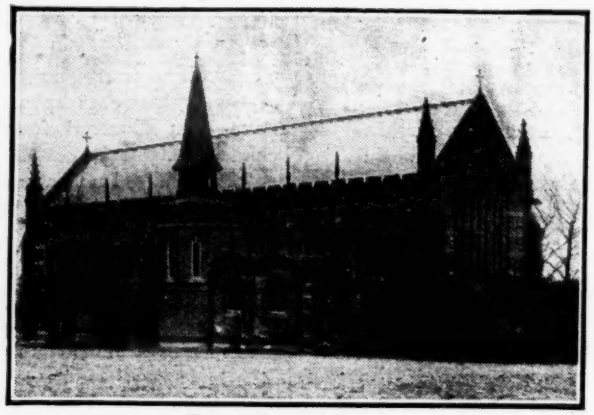
A COMMUNICATION we have received from Dr. P. C. Brett directs attention to a change in the composition of the tincture of iodine of the French *Codex*. It is now officially prepared from iodine with potassium iodide, whereas formerly it consisted only of iodine dissolved in alcohol. Dr. Brett suggests that it is being prescribed with increasing frequency in this country, and expresses a doubt whether it is known that the name does not designate what it must be presumed the prescriber desires, for the new tincture of the *Codex* is not unlike that of the *British Pharmacopoeia*. Iodine is so briskly reactive that it enters into chemical reaction with the first portion of food or tissue met. We have seen a mixture in which the iodine had been reduced in a few days to half the amount originally present, the rest having been consumed by the cork. Some of the compounds formed with food would be stable; others would slowly set the iodine free again. Thus the character of the therapeutic effect might vary according to the quantity of food in the stomach. When prescribed with potassium iodide, iodine wanders a little less readily into other combinations; its combination with potassium iodide, although weak, depends on chemical affinity. We do not know whether the old formula of the French *Codex* was expressly designed to produce a tincture devoid of potassium iodide, or whether it was considered that the amount of potassium iodide in the new tincture was so small as to have no appreciable physiological effect. It occurs to us that there are other ways open to exploration for the exhibition of iodine by which the rapidity of its chemical action might be moderated. If the iodine were dissolved in an inert oil such as liquid paraffin, and the oil dispensed as an emulsion, the chemical reactivity of the iodine would be damped, and there would be less interference with the simplest form of its physiological action.

AMONG the fifteen candidates recommended by the President and Council of the Royal Society last week for election to be Fellows are: Dr. C. A. Lovatt Evans, professor of physiology at St. Bartholomew's Hospital Medical School (University of London); Dr. F. Wood Jones, professor of anatomy in the University of Adelaide; Dr. Edward Mellanby, professor of pharmacology in the University of Sheffield and physician to the Royal Infirmary there; and Dr. James A. Murray, director of the Imperial Cancer Research Fund.

EPSOM COLLEGE CHAPEL.

CONSECRATION BY THE BISHOP OF WINCHESTER.

THE nave of Epsom College Chapel, which has been rebuilt on an enlarged scale as a memorial to the 140 Old Epsomians who fell in the war, was consecrated by the Bishop of Winchester on February 21st. The addition completes the original design of thirty years ago, when the late Sir Arthur Blomfield designed the chancel, which was built by Messrs. Dorey and Sons. Mr. Arthur Blomfield, the architect of the new nave, has continued his father's designs, and Mr. John Dorey has similarly completed the work begun by his father. Sir Henry Morris, Bt., who was present as a boy at the opening of the school in 1855, was a member of the council for thirty-six years and recently resigned the office of treasurer, which he held for eighteen years, was one of the most energetic supporters of the project, and it was largely due to his advocacy that this work was started at a time when the available funds seemed hardly adequate. The cost of the rebuilding has been £11,500, of which about £2,000 remains to be raised. The money has been subscribed mainly by the relatives of the fallen, by Old Epsomians, and by parents of boys now in the school. To provide for the increased number of boys the nave has been enlarged in width and length even beyond the original designs, and, with the addition of the western gallery, furnishes accommodation now for 650. The nave is built of red brick inside and outside, with Bath stone windows and dressings; the roof is covered with green slates; and the spire of the bell turret over the new organ chamber, on the south side of the nave, has been finished with split oak shingles. A new oak front has been fitted to the organ chamber to match the other woodwork in the chapel, which is of Austrian oak. The floor of the nave is laid with oak blocks, and the seating is by chairs.



EPSOM COLLEGE CHAPEL.

Fourteen hexagonal coronas of wood, decorated in colour, carry the electric lighting for the nave, the chancel being also illuminated by strips on the walls. A new hot-water system has been introduced. A tablet has been inserted on the north wall with a list of 140 names, omitting honours and awards. During the ceremony three wreaths were placed beneath it by the head prefect, the second master, and the president of the Old Epsomian Club.

The Bishop of Winchester in his address took for his text Revelation xxii, 2: "The leaves of the tree were for the healing of the nations." He referred to the legend which connected the Tree of Life in the Garden of Eden with the Cross of Calvary. When Adam was dying, Seth, his eldest son, was said to have endeavoured to bring a branch of the tree to save his father's life, but arrived too late. Solomon subsequently endeavoured to incorporate the tree in the Temple building, but nowhere would it fit. It was then cast aside to be used as a bridge; and, when afterwards it was thrown into a well, it conferred healing properties on the water. Eventually, the legend concludes, the tree was used for the Cross. So in later times the sign of the Cross had stood for the healing of the nations. Those who had died for the healing of a sick world from its commercialism, crass nationalism, and individual selfishness, had in very truth made the sign of the Cross, and henceforth the school that sent them forth was holy ground. The day was, therefore, one of solemn dedication for the school, and the consecration of the chapel would find its completion in the future lives of those who would worship within its walls. The present generation had received a challenge to effect the completion of the healing of the world. This was most particularly true of the medical profession, into which so many boys of Epsom College were intending to enter. The very foundation of healing, whether of nations or of individuals, was service and sacrifice.

England and Wales.

DR. WARDROP GRIFFITH OF LEEDS.

DR. T. WARDROP GRIFFITH has tendered to the council of the University of Leeds his resignation of the professorship of medicine. In his letter to the council he pointed out that in harmony with the rules of the General Infirmary at Leeds he becomes a member of the consulting staff next September, by which time he will have served for twenty years on the full staff. It was this fact, he said, which had led him to anticipate the age limit for the tenure of office which attaches to professorships in the University; for although in Leeds members of the consulting staff have, happily, the privilege of admitting a limited number of patients to be under their care in the infirmary and continue to work within its walls, he felt that the best interests of the University would be served if he did not retain the professorship after he had retired from the full staff and the regular routine teaching which that involved.

At its meeting on February 18th the council of the University adopted the following resolution:

> The council accepts the resignation of the senior professor—Professor T. Wardrop Griffith—with deep regret. He was appointed to the chair of anatomy in 1887 and transferred to the chair of medicine in 1910, a continuous record of thirty-eight years. He began work in the old medical school in Park Street, and took an active share in the construction of the new school in Thoresby Place, in which he established one of the best anatomical departments in the kingdom, filling it with many valuable collections, and in one cardiac section a unique collection of specimens prepared by his own hand. His assiduous attention rendered his tenure of office of the chair of anatomy little different from a full-time office, as every hour spared from hospital work and consulting practice was spent with energy in the department, and there is no department of its kind more entirely the creation of one man's zeal and love. In his tenure of the chair of medicine he has added to the lustre of its history by the high quality of his observations in clinical fields and able exposition of his subject, attaining an eminence acknowledged by his admission to the Order of St. Michael and St. George and the conferment of the honorary Doctorate of Laws by his own University of Aberdeen. In both departments his courses of lectures have been noted for their vivid quality and the perfection of arrangement and delivery. In the Faculty and University he has played an important part by sound advice and an example of devotion, for which a heavy debt of gratitude and affection is due. His resignation marks the completion of one of the soundest pillars on which the school has been reared, and the council, looking forward to the support which will remain in his work and the effects of his work, desires to record its appreciation of his most valuable and enthusiastic services, its grateful thanks for the distinction he has brought to the University, and its cordial hope that he will, for many years to come, enjoy the ability to pursue the practice of his profession and add to the many contributions by which he has advanced the cause of medicine.

The rule of Leeds Infirmary, which permits a consulting member of the staff to retain a certain number of beds (we believe six) is a wise one, and we could have wished that Dr. Griffith had considered that it justified him in retaining his chair, though perhaps the pressure of private work, in the prosecution of which neither the profession nor the public in the West Riding is likely to allow him to relax, has had something to do with his decision; there will be nothing to prevent him from giving us in the future further examples of his great capacity as a clinical lecturer.

ARTIFICIAL SUNLIGHT TREATMENT AND THE PUBLIC TUBERCULOSIS SERVICE.

The London County Council has had before it a request from the Bermondsey Borough Council for a grant towards the cost of a scheme for the provision and equipment of

premises suitable for giving artificial or natural sunlight treatment to tuberculous or other persons, the scheme to be regarded as a development of or adjunct to the existing tuberculosis dispensary service in the borough. The Public Health Committee of the County Council has reported that while, in expert hands, the success of artificial light treatment in lupus is incontestable, it is still to some extent in an experimental stage in surgical tuberculosis, and appears to be not at all suitable in all types of cases of pulmonary tuberculosis. The committee has also pointed out that treatment by artificial light is available at various general and special hospitals in London, and is not limited to tuberculous cases. The London Hospital, Guy's, and St. Thomas's are increasing their facilities therefor. It appears unquestionable, according to the committee, that there is sufficient provision in the hospitals to enable a large-scale test of the treatment to be made, and it is taking steps with a view to arrangements for such a test being proceeded with as speedily as possible. It is felt, therefore, that provision by borough councils of facilities for treatment by artificial light as part of the arrangements at tuberculosis dispensaries should not at present be approved by the County Council for the purposes of grant.

Medical Hydrology in Great Britain.

The Committee for the Study of Medical Hydrology in Great Britain has arranged for a third course to be held at the University of London, from April 27th to May 2nd. The subjects to be dealt with include: types of water which occur in nature; hydro-geology; the capillary circulation of the skin; and the use of medicinal waters, baths, and heat in the treatment of disease. Demonstrations on the analysis of waters and of the effects of open air and sunshine on the body will be given. In connexion with this course visits will be paid to Buxton and Matlock. Full particulars may be obtained from Miss Hilda Fox, c/o University Extension Department of the University of London, South Kensington, S.W.7.

Scotland.

Edinburgh University Cameron Prize.

At a meeting of the University Court of Edinburgh University on February 16th it was announced that the Senatus had resolved, on the recommendation of the Faculty of Medicine, to award the Cameron Prize for 1925 to Professor R. Magnus of Utrecht University, Holland. This prize, of the value of about £200, is awarded annually to a person who, in the course of the five years immediately preceding, has made some highly important and valuable addition to practical therapeutics.

Royal Society of Edinburgh.

The following are among the thirty-eight candidates recommended for election as Fellows of the Royal Society of Edinburgh on March 9th: Dr. T. W. Naylor Barlow, O.B.E., past-president of the Incorporated Society of Medical Officers of Health; Dr. Sahay Ram Bose, professor of botany in the Carmichael Medical College, Calcutta; Dr. Henry Dryerre, lecturer in physiology, University of Edinburgh; Dr. D. Middleton Greig, conservator of the museum of the Royal College of Surgeons, Edinburgh; Dr. W. Henry Lang, F.R.S., Barker professor of cryptogamic botany, University of Manchester; Dr. Richard L. Sutton, professor of diseases of the skin, University of Kansas School of Medicine, U.S.A.; Wing Commander Harry M. S. Turner, M.B.E., Royal Air Force Medical Service; and Mr. David P. D. Wilkie, O.B.E., professor of surgery, University of Edinburgh.

Edinburgh Education Authority and Mental Defect.

A joint conference of representatives of the Edinburgh and Lothians Education Authorities was held on February 11th to consider the question of accommodation for mentally defective children. Dr. Sym (Edinburgh) occupied the chair, and in opening the discussion referred to the position in Edinburgh, where he said that in special schools and in special classes in ordinary schools about 420 defective children who were educable were under training, and in other institutions there were uneducable children to the number of 25 or 27. The problem of mental defect had two very difficult aspects. One was what type of education should be given, and the other was what would become of the children after the age of 16. It was useless to send children to special schools and then turn them adrift. Means must be devised for dealing with mentally defective adolescents and adults. The Rev. Charles Dunn (Uphall) said that in Linlithgowshire there were 186 mentally defective children, of whom 26 were not educable. The authority had special classes, but was not satisfied that these classes fully met what was wanted. It had before it a proposal to establish a farm colony for educable mental defectives, who might be made self-supporting so long as they were under supervision; a farm colony which had been established near Manchester had been found very satisfactory. Dr. Inch recalled that five years ago the Midlothian authority convened a meeting of representatives in the seven south-eastern counties of Scotland, but no conclusion was reached owing to failure of support from the Education Department, Board of Health, and Board of Control. In Midlothian the education authority had started a special school, and meant to start another. Mr. Kemp (executive officer, Midlothian) said that he was a strong believer in not removing the children from their homes if possible, for when children were taken away parents lost interest in them, and they were afterwards looked upon as a nuisance. It was wonderful what could be achieved by a sympathetic teacher in the special classes of day schools. Mr. William Taylor (Edinburgh) said the proper place to deal with educables was in special classes, and it was unwise to remove children to an institution, which had the effect of branding them as mental defectives. He estimated that 80 per cent. of the children who attended the special classes in Edinburgh found occupation on leaving school. It was agreed that the representatives should report to their various authorities, and that another conference should be held after they had received instructions, particularly in regard to a proposal for co-operation with parish councils.

Redlands Hospital for Women, Glasgow.

Redlands Hospital for Women, formerly known as the Glasgow Women's Private Hospital, is situated in the west end of Glasgow, and was formerly a large mansion. It has been altered and enlarged, and is now a well equipped hospital of fifty beds. It is the only hospital of its kind in the West of Scotland, and with the exception of four honorary consulting officers is staffed by medical women. The patients all contribute to their maintenance. Those in the wards pay 30s. weekly, but receive free medical and surgical attendance. There are rooms with four beds, two beds, and one bed; the payments for these range from £2 2s. to £4 4s. a week, and the patients occupying them may be charged a modified fee by the doctor in attendance. There is also a well equipped maternity department, having a ward and single-room accommodation and an up-to-date labour room. At the formal opening of the hospital by Viscountess Rhondda, Mrs. Greenlees occupied the chair, and among those present were Miss Melville (convener of the executive committee), Mrs. D. M. Ross, Dr. Alice McLaren (senior member of the staff), Miss McLean (matron), and Mrs. Craig (honorary secretary). Mrs. Greenlees said that the hospital had started in 1903 with eight beds. It had removed to larger premises (sixteen beds) in 1915; but that accommodation soon proved too limited, and finally, in August last, the hospital was moved to Redlands, which provided ample accommodation for fifty patients. Lady Rhondda, in declaring the hospital open, said that in all the big towns the need for such hospitals was felt and supplied. The demand was often inarticulate, but nevertheless urgent. Undoubtedly many women went on suffering too long where there was no facility to consult one of their own sex. She sincerely hoped that the £20,000 required by the new hospital would soon be oversubscribed. After votes of thanks had been adopted to Lady Rhondda and Mrs. Greenlees, those present had an opportunity of inspecting the hospital.

GLASGOW CONVALESCENT HOME.

The report presented to the sixtieth annual general meeting of the Glasgow Convalescent Home stated that during the past year 1,428 patients had been admitted, of whom 422 were convalescents from the Royal and Western Infirmaries, while 985 had been admitted on subscribers' recommendations from other sources. The average stay of patients had been 13.4 days, and the cost had been 11s. 4d. a patient per week as compared with 12s. 3d. in the previous year. The ordinary income for the year had been £3,887, which was £304 less than the ordinary expenditure. The Lord Dean of Guild (Dr. R. T. Moore), moving the adoption of the report, stated that the home was established sixty years ago, and observed that it was of special interest to find from the records that the late Lord Lister had been intimately connected with the founding of the institution; for a number of years from 1865 onwards he had been one of the board of managers, and had assisted from the very commencement of the home in raising funds and in drafting rules. Mr. Kerr, who moved a vote of thanks to the directors and staff of the home, mentioned a further point in connexion with Lord Lister, in that he had carried out some of his experiments in a druggist's shop at the corner of Glassford Street and Wilson Street, an establishment which had celebrated its hundredth year in 1924; the exterior of the premises had remained unchanged during the whole of that period.

Medical Notes in Parliament.

[FROM OUR PARLIAMENTARY CORRESPONDENT.]

THE House of Commons has been chiefly occupied with Supplementary Estimates and the Air Estimates this week. The Supplementary Estimates for Expenses under the National Health Insurance Acts were reported without discussion, and there was only a brief debate on the Supplementary Estimate for the Ministry of Pensions, the point at issue being final awards. On this point Major Cohen and other members have put down a motion asking for a Select Committee of Inquiry.

Indian Medical Service.

Lord Sydenham has given notice that at an early date he will, in the House of Lords, ask the Secretary of State for India the present position of the British element in the Indian Medical Service as regards strength on the establishment and recruiting in this country; and also whether measures are in contemplation adequately to fulfil the medical requirements of the Indian Army, British residents (official and non-official), and the civil hospitals, and to secure the progress of medical science in all its branches throughout India.

Public Health Commissioner, India.

Mr. William Graham, on February 23rd, asked Earl Winterton, the Under Secretary of State for India, whether he was aware that the Government of India had confirmed and made permanent in the post of Public Health Commissioner with the Government of India an officer who did not hold a diploma in public health, notwithstanding the fact that it was specifically laid down that no officer was to be accepted for any post in the public health department of India unless he possessed such a diploma; and whether he was aware that when in 1918 a similar case arose the officer holding the post temporarily was not confirmed in the appointment.

Earl Winterton replied that the answer to both questions was in the affirmative.

Mr. Graham further asked why the appointment was confirmed in the case of the present officer, "thus blocking promotion to men in the service who held the obligatory qualification for the post."

Earl Winterton, in response, promised that he would furnish a detailed statement of the high qualifications and wide experience which in the opinion of the Government of India fitted the officer in question for the post of public health commissioner.

This statement, which was circulated to members, showed that the officer to whom Mr. Graham referred was Lieut.-Colonel Graham, who graduated M.B., C.M.Glas. with high commendation, and spent four and a half years in post-graduate work and hospital resident posts before passing into the Indian Medical Service in January, 1900. He was, the statement added, first in the London examination and again headed the list in passing out of Netley. In 1906-7 he passed the examination of D.T.M. and H., Liverpool University, and obtained the certificate of the Liverpool Tropical School, taking the first place on both occasions. In April, 1908, he entered the United Provinces Civil Medical Department, and from then, with the exception of one and a half years during which he acted as a civil surgeon, he was engaged on research, epidemiological, and public health work until mobilized for the great war in 1914. During this period he served on sanitary and public health committees in the United Provinces. During the war Colonel Graham was employed exclusively on sanitary and public health work. After service in Egypt he was transferred urgently to Iraq, where, in December, 1916, he was appointed Chief Sanitary Adviser to the Forces, which position he retained for three and a half years. He was responsible for the commencement of all civil health control throughout the occupied area in Iraq, where he became Inspector-General of Health Services. On his return to India in 1924 Colonel Graham was appointed officiating Public Health Commissioner with the Government of India, which post he still holds.

Welsh Regional Pensions Office.—The Parliamentary Secretary of the Ministry of Pensions, Colonel Stanley, on February 23rd informed Mr. Morris that he could not reconsider the decision to close the Welsh regional pensions office at Cardiff. The Welsh members during debates in the previous week had made a protest, which was supported by Mr. Lloyd George, against the decision. It was stated that the saving in administration would be £9,000 a year.

Nursing Bill.—The introduction of the Nursing Homes (Registration) Bill to provide for their registration and inspection was postponed from February 24th to February 25th. The bill was introduced by Mr. Gerald Hurst, who, on February 23rd, attended a meeting of the Medical Committee of the House of Commons which had been called to hear from him an explanation of the measure. Mr. J. F. P. Rawlinson, K.C., was also invited to attend this meeting.

National Insurance.—Mr. Hayday, on February 24th, asked the Prime Minister whether he was prepared to recommend the extension of the terms of reference of the Royal Commission on National Health Insurance. Mr. Baldwin replied that the Government did not propose to extend the terms of reference of the Royal Commission constituted to deal with the particular question of national health insurance. Mr. Hayday also asked Mr. Baldwin whether as an alternative he would set up a separate commission with a view to a comprehensive inquiry into all forms of social insurance, and into the possibilities of fuller co-ordination. Mr. Baldwin referred Mr. Hayday to replies given on February 16th, which announced that the inquiries promised by the King's Speech into the "all-in" scheme of insurance were proceeding and that no statement was yet possible.

Notes in Brief.

In any revision of the Milk (Special Designations) Order the Minister of Health will consider enforcing the use of coloured labels to indicate the grades of milk.

The Minister of Pensions denies that there are general complaints about the periods of waiting undergone by men attending medical boards for "reboarding."

The records of the Pensions Appeal Tribunal do not show the number of appeals for pensions made during 1924 by men suffering from tuberculosis.

Approximately 450,000 final pensions awards have been made since January, 1922, 46 per cent. of them for injuries.

The Home Secretary has asked for fuller information in regard to a request from the Labour benches that "bursitis" should be added to "miner's beat-knee" in the schedule of industrial diseases.

Returns in 1923 from education authorities in England and Wales show about 30,000 educable mentally defective children, and about 106,000 physically defective children, including about 49,000 classed as "delicate." About 11,000 mentally defective and about 33,500 physically defective children are attending public elementary schools.

The Minister of Health does not recommend local authorities to adopt generally the proposal to erect flats with cubicle rooms for large families.

Mr. Neville Chamberlain maintains the decision of previous Ministers of Health that officials of his Ministry should not serve on local authorities.

In 1923 statutory declarations of conscientious objection to vaccination were received in respect of 284,551 children.

The Government contemplates a Smoke Abatement Bill, but fears it cannot be introduced this year.

Information on the number of Poor Law medical officers in England and Wales is not available, nor on their salaries. The approximate total remuneration of Poor Law medical officers, dispensers, and nurses in 1922-23 was £1,900,000.

In 1914 the number of bodies removed from Poor Law institutions to medical schools in England and Wales for the purposes of dissection was 301, and in 1923 388.

In the year 1924 approximately £11,700,000 was paid by the workers for national health insurance, £12,700,000 by the employers, and £6,800,000 by the State.

Some 400,000 children in England and Wales leave school each year at the age of 14. The Government is prepared to introduce this session legislation authorizing local authorities to compel unemployed children between 14 and 16 to attend continuation centres.

The Government will not agree to allow the removal of the bodies of those fallen in the great war from abroad to this country.

The Under Secretary of State for India stated that the Government of Bombay was considering the question of the administration of opium to children. According to official statistics, infant mortality in Bombay during 1921 was not 666 per 1,000 as had been suggested, but 178.11 per 1,000.

The Government of India and the London Customs have been asked to report on the export of monkeys from India to Germany and this country.

Correspondence.

THE POSSIBILITIES OF EXPLORATORY THORACOTOMY.

SIR,—Professor Gask, in his very interesting article (February 21st, p. 343), does such scanty justice to the contributions of British civil surgeons to the surgery of the chest some decades before the outbreak of the war that some brief epitome of its evolution appears desirable. Your leading article upon the same subject offers some compensation, as the writer has apprehended clearly the real significance of Macewen's operation in 1897. The successful removal of a tuberculous lung was not the essential feature of his work—as might be gathered from a perusal of Professor Gask's article—but that he had opened the chest to its fullest extent to enable him to do so without respiratory embarrassment of a disconcerting degree. This free opening was made deliberately and with full confidence based upon the teachings of Lord Kelvin (Sir William Thomson as he was then), who had proved conclusively that lungs would not collapse under the direct influence of atmospheric pressure when the human thorax had been opened. Macewen showed this patient in good health at the International Congress of Medicine, London, 1913, and again expounded the physical principles enunciated by Lord Kelvin.

Those of us who were familiar with this work and with the work of other British surgeons who had followed Macewen's lead were merely amazed that pressure cabinets of the types of Sauerbruch, Willy Meyer, and Tuffier should be deemed worthy of anything more than a mere passing notice. By the time that they had been invented the problem of chest surgery had long passed the stage of being a problem of lung collapse: it had become one merely of control of infection. Within a few years of Macewen's operation, and many years before pressure cabinets had begun their ephemeral existence, Professor A. E. Barker at University College Hospital had operated quite successfully, as far as the physics of the chest were concerned, upon cases of gangrene of the lung, and during the year 1902, when it was my good fortune to be his house-surgeon, I assisted him at two or three of the operations. From him I learnt the technique of stitching the healthy area of extracted lung to the parietes before excising the enclosed patch of gangrene, so as to limit the spread of infection to the rest of the pleural cavity. In the year 1904 an opportunity came to me of putting Barker's procedure and Macewen's principles into practice; and the following epitome has just been extracted from the official medical notes of the Hospital for Sick Children, Great Ormond Street, of the year 1904:

> W. R., a boy aged 10 years, was admitted under the care of Dr. F. G. Penrose on April 6th, 1904. From the fetid expectoration and other signs the diagnosis of gangrene of the lung or lungs was obvious. The patient had been ill for many weeks and his condition was very critical.
>
> Operation was decided upon and carried out on April 7th. Localizing signs of the main area of gangrene were ambiguous, and it was decided to open the right side of the chest first. Nearly the whole of the seventh rib on that side was resected and a digital examination was made of the posterior, lateral, and phrenic surfaces of the lung. As no gross area of disease could be detected the chest was closed on that side, and with full assurance, based on Macewen's teaching, that no collapse of lung need be anticipated, a similar operation was immediately carried out on the left side of the chest. Nearly the whole of the lower lobe of the left lung was easily discovered to be in a gangrenous condition, and after pulling it through the chest wall to enable healthy lung to be stitched to parietes by Barker's method a large mass of it was excised. At no stage of the operation was collapse of the lung or respiratory embarrassment present. The notes state that "after the operation the patient's condition was very good." He became progressively worse, however, and died on April 8th.
>
> At the *post-mortem* examination no collapse of lungs apart from ordinary *post-mortem* changes was present: but multipe small abscesses and focal areas of gangrene were scattered throughout both lungs. These latter conditions, present before the operation, but not clearly indicated by physical signs, were the only factors that robbed the operation of success, and not discarded hypotheses about the physical reasons for collapse of lungs.

In a review of "Fifty-five Consecutive Cases of Empyemata" (*Lancet*, February, 1909) the mechanics of collapse of lung were elaborated in some detail, and attention was called to the soundness of Macewen's principles by allusion to the regularity with which lungs expanded on opening the pleural cavity in cases of *recent* empyemata: in fact, as many operators were fully aware, the exuberant resilience of the lung under such conditions became quite frequently an embarrassment to the establishment of effective drainage for the infected cavity.

Finally, decortication of a collapsed lung is no new operation—it was frequently performed by Stansfield Collier at the Great Ormond Street Hospital during the years 1903 to 1908; and the boldness with which the operation was planned and executed was based upon a sound knowledge of Macewen's teaching. During all this bygone period lung abscesses due to foreign bodies were sought for by "exploratory thoracotomies," at a time when radiography was little help in aiding clinical methods to localize their site, and pieces of string and husks of dried grass that had been inhaled were successfully removed when the operator was fortunate enough to localize the abscess. The landmarks of chest surgery were *not* set up by French, German, or military surgeons of the year 1916! They had been erected long previously by British surgeons and scientists, who were the teachers of my generation and of a generation earlier than mine. Honour to them has long been overdue; to render it in some humble degree is the sole motive of this letter.

Professor Gask has done noble work on the surgery of the chest that has secured him his niche in fame. That other niches are already occupied by pioneer associates of British origin too should not make it any the less acceptable to him.—I am, etc.,

London, W.1, Feb. 22nd. GEORGE WAUGH.

SIR,—I have been interested in Professor Gask's paper on the possibilities of exploratory thoracotomy. I cannot, however, agree with his view of the position of thoracic surgery at the advent of the great war, for some of us for years before the war had been performing thoracic operations of the kind to which he refers.

Professor Gask mentions that Macewen removed a lung in 1897. I may refer him to the following accounts of cases published by me: (*a*) A case of successful excision of a portion of the right lung for pulmonary tuberculosis (*Lancet*, July 21st, 1906); (*b*) the surgical treatment of chronic pleural effusions (*Practitioner*, February, 1911). For more than forty years it has been my practice to drain cases of empyema by means of a double incision with a large tube threaded through; this admits as much air into the pleural cavity as would be admitted by an incision for exploratory purposes. I have performed a very large number of these operations without the aid of any of the costly pressure chambers mentioned by Professor Gask.

Hence it is evident that surgeons before the war were not all imbued with the "widespread, though ill founded, belief that on the opening of one pleural cavity under ordinary atmospheric pressure not only one lung, but both lungs, would collapse and the patient die of asphyxia."—I am, etc.,

Kidderminster, Feb. 23rd. J. LIONEL STRETTON.

CANCER OF OESOPHAGUS.

SIR,—May I make a plea for earlier gastrostomy in the treatment of cancer of the oesophagus? Many cases present themselves in this district when the disease is already somewhat advanced. If in these conditions oesophagoscopy is performed, not only is the ulcerated constriction seen to be irritated by endeavours to pass food, but it bleeds easily, is oedematous, and generally bathed in foul mucus, rendering any dilatation or the passage of tubes difficult, and, when the trouble is situated just behind the aortic arch, very hazardous.

The result of gastrostomy is very marked. After ten days or a fortnight much of the irritability disappears, and manipulations through the oesophagoscope are thus rendered more easy of performance. Particularly did I notice this in the case of a lady with a malignant stricture thirteen inches distant from the teeth, into which I endeavoured to pass a radium cylinder. The attempt failed owing to free bleeding. Gastrostomy was then performed under local anaesthesia, and ten days subsequently

it was found quite easy to insert the radium, the stricture having been rested and bleeding being absent. Senn's method of gastrostomy is easy of performance, is readily done with a local injection of novocain and adrenaline, and causes no shock and very little discomfort to the patient; feeding can immediately be commenced, the patient rapidly gains in weight and strength, and the rest given to the stricture renders further treatment considerably easier. And, after all, is it not carrying out an important surgical principle of giving rest to a diseased structure, and analogous to colostomy in rectal carcinoma?—I am, etc.,

Portsmouth, Feb. 16th. C. A. SCOTT RIDOUT.

THE INFECTIVITY OF SMALL-POX IN THE INCUBATION STAGE.

SIR,—It seems to me highly important that the general statement contained in Dr. Rolleston's book on *Acute Infectious Diseases* that "the small-pox patient is infectious in all stages of the disease, even in the incubation period, before any symptoms have appeared," should be fully considered.

Quotations from foreign publications to the effect that patients in the incubation stage *may* be infectious do not seem to me to be final. More convincing evidence for such a heterodox view is called for. Our administrative procedures are built up on the contrary hypothesis.

1. When a person has been in known contact with a small-pox patient it is regarded as sufficient that that person should be visited on the twelfth day after the appearance of the rash on the patient and for about six days afterwards. My experience of many hundreds of cases of small-pox has never led me to regard this as a defective procedure. In other words, I have never had reason to suppose that the infection could have been contracted at a time prior to the appearance of the rash.

2. The course recommended officially by the Ministry of Health, and adopted, I believe, in most areas, of not taking any steps for the isolation of contacts, would lead to disaster, if it be admitted that the ordinary case of small-pox is infectious in the incubation stage.

3. If the twelve days' incubation period is really an infectious period, it would be impossible for any local authority to cope with an epidemic of small-pox, except by general vaccination; if every patient were a medium of infection for twelve days before any symptom of illness, no policy of isolation could be successful; yet in practice—with adequate staff and systematic following up of contacts—small-pox is one of the most easily controlled of the infectious diseases, in spite of the disregard of vaccination and in spite of the anomalously mild character of the present epidemic.—I am, etc.,

Coventry, Feb. 17th. E. H. SNELL.

THE HYPOTONIC (FLABBY) CHILD.

SIR,—Dr. Donald Paterson's paper (February 14th, p. 301) on the hypotonic child brings forward points of great interest and importance. He rightly points out that a large proportion of the children attending an out-patient clinic present the characteristics of this type of child, and it is from amongst them that many of the rheumatic, cardiac, tuberculous, orthopaedic, and eye cases are recruited. Whilst the muscular hypotonia is possibly the most striking defect, yet with the hypotonia there almost always exists a toneless state of the other systems, especially the circulatory and the vasomotor, in the nervous tissues, and in the mucous surfaces with their underlying lymph nodes.

In discussing the factors at work in the production of this health defect Dr. Paterson refers to a paper of mine (*Lancet*, August 2nd, 1924) with reference to the "debilitated child," and quotes me as stating that a toxaemia plays an important part in the production of this physical defect. This is not quite as I expressed it. The child discussed by me was the child of school age rather than the child between the ages 2 and 7 discussed by Dr. Paterson, and although I used the word "hypotonia" in relationship to the muscular system, yet the words "toneless" and "wasted" are perhaps more applicable to the age period I was considering than the hypotonia of the flabby younger child. I think, however, it only a question of degree, and that the same etiological factors are at work in the case of both age periods. I gave it as my opinion that there are two main factors—a dietetic and a toxic—to be considered, the former being the cause of the toneless condition, and the latter the cause of the numerous superadded symptoms, such as the limb pains, headaches, nervous irritability, and glandular hyperplasia. I am therefore in agreement with Dr. Paterson in believing that the hypotonia has a dietetic origin; and while he would make want of muscular exercise an additional cause—and no doubt this and other hygienic defects are contributory factors—yet I hope and believe that he will agree that the dietetic is far and away the most important. It appears to me that Dr. Cameron (BRITISH MEDICAL JOURNAL, November 24th, 1923) was referring to this same type of case in his paper, to which Dr. Paterson also refers, and also Dr. Lapage (BRITISH MEDICAL JOURNAL, July 2nd, 1921) when he drew attention to certain problems in connexion with the toxic states of childhood.

I suggest that all of us have attempted to draw attention to, and give reasons for, certain very common defects in health which in the past have been neglected in favour of what one may call the "graveyard conditions," and the rare types of case which, while of interest to the few, are of little importance as compared to these health defects which are the forerunners of most of the common diseases of childhood, and indeed of adult life. I hope, therefore, that Dr. Paterson's contribution, and Dr. Lucy Wills's report upon her investigation of this type of case published in the same issue, may stimulate further study and draw attention to a subject of first importance from a national standpoint.—I am, etc.,

Leeds, Feb. 15th. C. W. VINING.

SIR,—Under this heading Dr. Donald Paterson (BRITISH MEDICAL JOURNAL, February 14th, 1925) unwittingly gives an accurate though incomplete account of chronic intestinal stasis as seen in children. His observations on the causes of the condition prove that he is, in fact, describing stasis. The lines of treatment which he favours include some of those most useful in stasis. His treatment would be even more remarkable in its results were it preceded by a search (clinical, radiological, bacteriological, and chemical) for evidences of stasis. Radiological observations might disclose the need for surgery, and in every case colloidal kaolin (kaylene) and liquid paraffin should be prescribed.—I am, etc.,

London, W.1, Feb. 19th. A. C. JORDAN.

TESTS FOR DRUNKENNESS.

SIR,—The letter in your issue of January 31st (p. 240) by Sir Charles A. Ballance and Dr. Maurice Cassidy comes at a very opportune time.

With regard to the reply of Sir James Purves-Stewart of February 7th (p. 282), may I observe that there is, unfortunately for the medical profession, another side to the question? What are the magistrates on the bench to conclude when, on the one hand, they hear several police constables, whom they know to be thoroughly reliable officers, as well as independent lay witnesses, supported by the police surgeon, probably a man of great experience and integrity, state on oath that the defendant was drunk (as Sir Francis Champneys happily suggests, "the worse for drink"); on the other hand, on the part of the defendant, if a substantial person, medical men of eminence can be found to take oath and say that he was perfectly sober?

It must not be presumed that because the court in the circumstances does not record a conviction that the magistrates have any real doubt in their minds on which side the truth lies.

In conclusion, I give this for a moral. A few years ago the certificate of a duly qualified medical man was always accepted in any court of law. At the present time no court will accept a medical certificate.—I am, etc.,

Hove, Feb. 18th. H. H. TAYLOR, J.P., F.R.C.S.

SIR,—To those interested in tests for drunkenness the following facts may appeal.

When I was appointed a police surgeon I had been in active practice for ten years and considered myself perfectly capable of diagnosing drunkenness; but my self-reliance was misplaced, as two instances among many will show.

I was called to one of my stations to see a man who denied being drunk, and in furtherance of my scheme of investigation I talked with him for probably half an hour, during which the usual tests were applied. I then said to the inspector, "I do not think this man is drunk." On this the officer told the prisoner that "as the doctor said he was sober he might go." Much pleased with this result he relaxed his tension (which I had failed to estimate), fell down the station steps, and came to rest in a confused heap on the pavement. Much to my disgust I had to withdraw all I had said and certify him.

On another occasion an alleged "drunk," similarly allowed to go, fell into the hands of another officer, who knew nothing of the previous charge, and was brought in again by him. After years of experience I got to know, although my nephew, Dr. George Grant, required some convincing in the matter, and he got his lesson in this way:

Going with me to the station one evening he disagreed, in somewhat indignant terms, with my diagnosis of drunkenness in regard to a prisoner. However, I certified and told the police to put the man in a cell. I then took my nephew for a short walk, and on our return to the station, probably in a quarter of an hour, we went to visit the accused. He was asleep on the wooden bench, breathing stertorously; he was awakened with difficulty and was unable to stand when pulled up. In addition, his confusion of ideas was so obvious, and the alcoholic odour in the cell so marked, that when I said to the doctor "Is that man drunk or sober?" he replied, as other medical men similarly instructed have replied—"Drunk."

Experientia docet.—I am, etc.,

London, E.C., Feb. 18th. GRAHAM GRANT.

ISOLATION HOSPITALS FOR SCARLET FEVER.

SIR,—Dr. Robert Watson's interesting letter is little help as a reply to my question. Purposely I said nothing on the well worn topic of the failings of isolation hospitals in respect to scarlet fever.

Everyone with experience is agreed that individual cases—with or without inunction treatment—would best be treated at home; but practically the difficulties are so great that the balance has inclined inevitably to the removal of the patient to hospital. I could point to pages in old annual reports, especially twenty to twenty-five years ago, where the whole question was discussed. Faith in the inunction treatment is not sufficiently firm and universal to satisfy the public, and hardship is very great when a case occurs in a small shop, such as a stationer's, or in a house used as a day school for small children. We have committed our generation to hospital isolation, and the important thing is to make the best of it. I now believe that the want of protected exercising space is one of the weakest points in the administration of these hospitals, and my query was whether, with building prices as they are, it would be justifiable to insist upon extra expenditure in this direction. Dr. Watson calls this "a call for 'more stately mansions' in the isolation camp." I still hope that some correspondent may see my point and give the help of his opinion.—I am, etc.,

Bromsgrove, Feb. 21st. H. CAMERON KIDD.

*** We hope that we shall not be asked to allow this correspondence to drift into a discussion of the value of inunction in scarlet fever.

THE LAW OF THE ROAD.

SIR,—It would seem that many writers on traffic dangers are not conversant with the law of the road. Under the Highway Act of 1835, the driver of every cart, carriage, or other vehicle is bound to keep to the left, or near, side of the road when meeting another cart, etc. Mark carefully it is *side*, not *half*, to which the driver has to keep. During the many years (over sixty) I have been a driver of different vehicles I have even found stipendiary magistrates ignorant of this law. The penalty is—for an owner driver, not exceeding £10; for a hired driver, not exceeding £5.—I am, etc.,

Bury, Feb. 21st. JAMES HOLMES.

SIR,—The suggestion of Dr. Charles Buttar—the "right-hand" rule—has sense and simplicity to recommend it, and at sea, applied as the "starboard" rule, has the experience and tradition of the sailors to speak for it.

The executive of the British Medical Association, entitled to speak with authority on behalf of a very large body of motorists, and also in the interests of public health, might well bring this suggestion before the Minister of Transport, and the thing is done and done quickly.

Dr. Buttar's article tells the old sad story of the lonely furrow, which apparently he has fruitlessly ploughed for many years.—I am, etc.,

London, S.W.1, Feb. 23rd. REDMOND ROCHE.

A JOURNALISTIC INDISCRETION.

SIR,—I associate myself entirely with Dr. Drury Pennington's statement to you that neither he nor any of his colleagues knew that the recent series of articles in the *Daily News*, dealing with 86, Brook Street, was being prepared or written. It was, indeed, part of the scheme of the articles that they should be the outcome of visits paid on precisely the same terms and under the same conditions as would be accorded to an ordinary member of the public. For that reason, obviously, we did not disclose to those conducting the establishment the fact that they were dealing with a representative of the *Daily News*.

I confess, however, that I do not see how you justify the use of your headline, "A Journalistic Indiscretion." Surely it is a matter of legitimate enterprise for a newspaper to make an actual and genuine test of a scheme which is so important from the public point of view.

I hope, in justice to the *Daily News*, you will publish this letter.—I am, etc.,

J. HUGH JONES,
London, E.C.4, Feb. 21st. Managing Editor.

THE DUODENAL FLORA IN ACHLORHYDRIA.

SIR,—May I ask you to publish a small correction of your report (p. 360) of my few remarks concerning the duodenal flora in achlorhydria? In cases showing marked anaemia I have certainly been impressed by the large number of living streptococci recoverable from the duodenum and by the fact that these cultures so frequently contain strains producing haemolysin. It is impossible, of course, to detect the haemolytic varieties in direct films.—I am, etc.,

Wimbledon, Feb. 21st. F. A. KNOTT.

ANAESTHETICS FOR REGISTERED DENTISTS.

SIR,—From letters which I have received I gather that some practitioners are in doubt as to the bearing of the following paragraph in the Warning Notice issued by the General Medical Council:

"5. *Association with Unqualified Persons.*

"Any registered medical practitioner who, either by administering anaesthetics or otherwise, assists an unqualified or unregistered person to attend, treat, or perform an operation upon any other person, in respect of matters requiring professional discretion or skill, will be liable on proof of the facts to have his name erased from the *Medical Register*."

I am directed to say that this warning does not apply to any person whose name appears upon the *Dentists Register*, whether so entered in virtue of a diploma or under the Dentists Act, 1921. A registered medical practitioner is entirely at liberty to give an anaesthetic for such a dentist.

In the SUPPLEMENT to the BRITISH MEDICAL JOURNAL of January 5th, 1924 (p. 23), there was a paragraph relating to this matter, in which it was stated:

"In these circumstances medical practitioners need have no hesitation in administering anaesthetics for a dentist without diploma when asked to do so, once they are satisfied that he is actually on the *Dentists Register*. There is, in fact, no legal justification for refusing to do so."

I think it might be helpful if the attention of medical practitioners was again drawn to their position in regard to this matter.—I am, etc.,

NORMAN C. KING,
London, W.1, Feb. 24th. Registrar, General Medical Council.

Obituary.

THE RIGHT HON. SIR T. CLIFFORD ALLBUTT,

K.C.B., M.D., LL.D., D.Sc., F.R.C.P., F.R.S.,

Regius Professor of Physic in the University of Cambridge; President of the British Medical Association, 1916-21.

(With Portrait by J. Palmer Clarke, Cambridge.)

THE medical profession has learnt with sorrow that Sir Clifford Allbutt died suddenly in the early morning of Sunday, February 22nd, at St. Radegund's, Cambridge, in his 89th year. His bodily powers had failed somewhat in recent months, but his mind was clear and active to the last day of his life. He woke up, and after a severe attack of breathlessness passed away in about ten minutes. In him British Medicine loses a great and venerated leader, full of years and honours, a scholar-physician and a great-hearted gentleman.

Thomas Clifford Allbutt was the son of the Rev. Thomas Allbutt, at one time vicar of Dewsbury, Yorkshire, and later rector of Debach-cum-Boulge in Suffolk, who married Marianne, daughter of John Wooler of Dewsbury, and was a friend of the naturalist Waterton. He was born at Dewsbury on July 20th, 1836. His early education was received by private tuition at Ryde, Isle of Wight, and his school days were passed at St. Peter's, York, then under the headmastership of Archdeacon Hey, the entomologist.

He entered Gonville and Caius College, Cambridge, in 1856, gaining a classical scholarship in his first year and others subsequently. About that time the Cambridge Medical Faculty was waking from its long sleep, and as many as six medical students were in residence together; they had to complete their course in Arts before commencing medicine. Natural science was already making enormous strides in the University. Allbutt graduated B.A. in 1859, and in the next year was placed in the first class in the Natural Sciences Tripos with distinction in physiology. His clinical education was received at St. George's Hospital, London, and he also studied for a time at Paris. He took the degree of M.B. at Cambridge in 1861, the M.A. in 1867, and proceeded M.D. in 1869. While at St. George's Hospital he formed a friendship with Dr. J. A. Lockhart Clarke, the anatomist and pathologist, and George Henry Lewes. The latter was then devoting a good deal of his time to preparing the chapter on the anatomy of the nervous system for his *Physical Basis of Mind*. Lockhart Clarke, although he had been qualified for several years, was taking out hospital work again at St. George's Hospital for the M.R.C.S. diploma at the time Allbutt was studying there. His microscopical work on the nervous system, which he carried out by a new method that revolutionized histological research, interested Allbutt and influenced him towards a similar line of study, and he published some of his earliest papers on diseases of the nervous system in the *St. George's Hospital Reports* and in the *Transactions* of the Pathological Society. He maintained his friendship with Lewes until his death in 1878, and George Eliot, writing of her tour in Yorkshire with Lewes in 1868, says: "We went on from Leeds to Bolton. Our visit to Yorkshire was extremely agreeable. Our host, Dr. Allbutt, is a good, clever, graceful man, enough to enable one to be cheerful under the horrible smoke of ugly Leeds. . . ." We also read of Allbutt visiting George Eliot and Lewes at their Witley home at a later date. There is good evidence that he was the original of Lydgate in George Eliot's *Middlemarch*.

In 1862 he was appointed honorary physician to the Leeds House of Recovery, and in 1864 honorary assistant physician to the Leeds General Infirmary, Dispensary, and Fever Hospital, and also lecturer in the practice of physic in the Yorkshire College, Leeds. Two years later he began to lecture in anatomy as well. He remained on the active staff of the Leeds General Infirmary until 1884, when, in accordance with the rules of the institution at that time, he gave up the charge of beds and joined the consulting staff. He continued in consulting practice until 1889, when he was appointed a Commissioner in Lunacy, and held this post for three years until his appointment as Regius Professor of Physic in the University of Cambridge and his election to a Fellowship at Caius College.

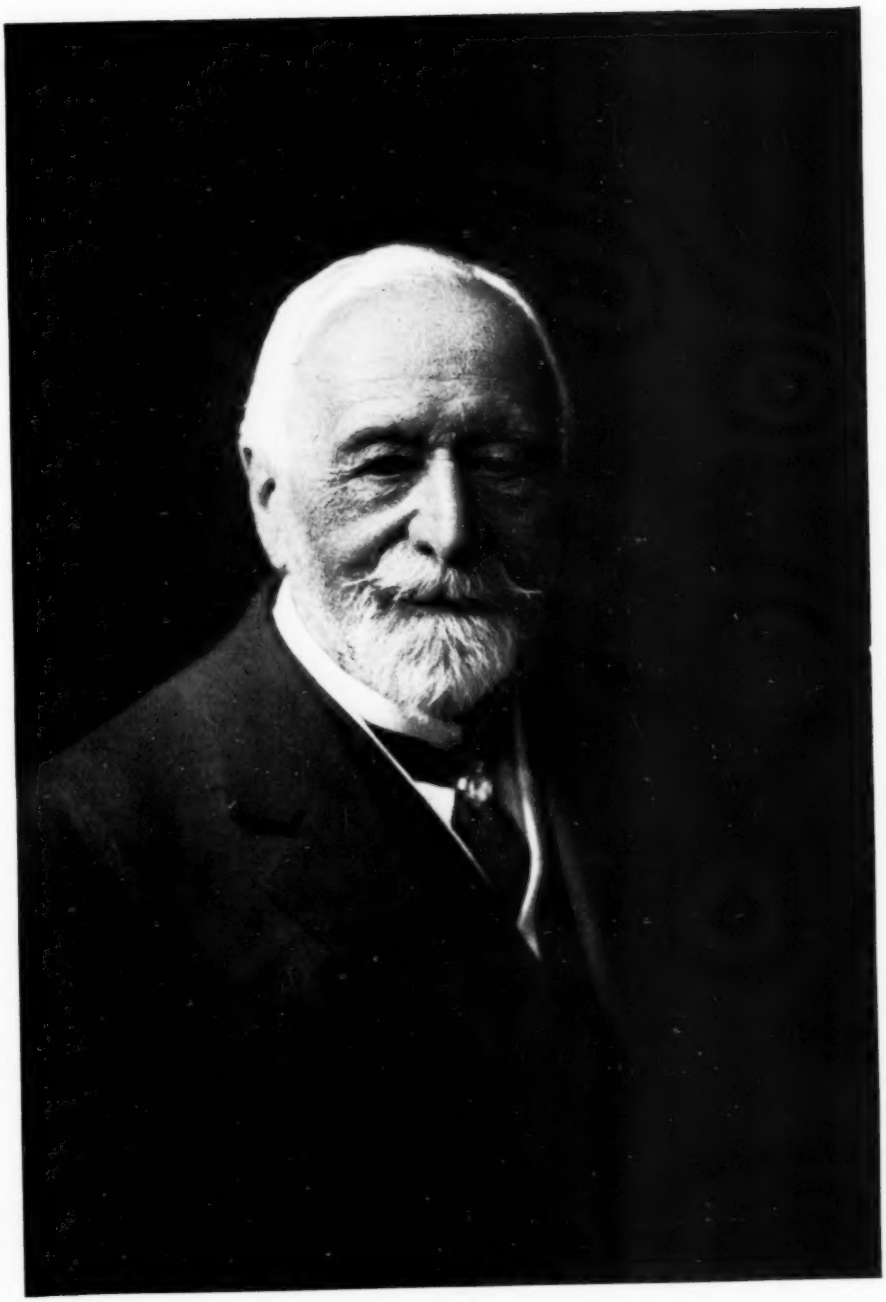
He became a Member of the Royal College of Physicians of London in 1878, and a Fellow in 1883. He was an examiner for the College in 1899, censor in 1905-6, and member of the council in 1906-7. In 1900 he delivered the Harveian Oration before the College, the Goulstonian Lectures in 1884, and the FitzPatrick Lectures in 1909-10. He was awarded the Moxon Medal in 1921.

His election in 1892 to succeed Sir George Paget in the Regius Chair of Physic at Cambridge University was generally applauded as likely to result in advantage to the University and to import into the region of medicine there a certain element of freshness and originality which could not be too highly rated. How fully that expectation was fulfilled is now a matter of history. Concurrently with his election to the professorship he was appointed physician to Addenbrooke's Hospital.

Allbutt's professional life naturally falls into two distinct periods—his Leeds consulting life, and his Cambridge academical work with an interregnum of lunacy commissionership.

At Leeds he lived the fullest possible life of a consulting hospital physician, clinical observer, and teacher. For many years his practice there was phenomenally big for a provincial consultant, and, in addition, he had his teaching. In his earlier years he was actively engaged in clinical research and writing papers, diseases of the nervous system and the effect of overstress on the heart chiefly interesting him. He was also collecting material for this work on the use of the ophthalmoscope in medicine (1871), and in the preparation of this he received much help from Dr. (afterwards Sir James) Crichton-Browne, who was then medical superintendent of the West Riding Asylum, and who had, in the face of considerable opposition, established a research laboratory there. This had for its title *The Use of the Ophthalmoscope in Diseases of the Nervous System and of the Kidneys and also in certain other General Disorders.* The book was dedicated to Hughlings Jackson in a prefatory letter in which Allbutt pointed out that they both had begun about the same time to use the instrument in the investigation of cerebral diseases, and paid a tribute of respect to Hughlings Jackson's friendship and help. Allbutt had received his first ideas of the probable value of the ophthalmoscope in the diagnosis of cerebral disease from Dr. Ogle when he was at St. George's Hospital, and he had continued his work on the subject at Leeds. In this book Allbutt traversed the whole field of the knowledge of the time, and gave his own experience, whether as original observations or in support of those of other observers. Perhaps the most original chapter is on the condition of the disc in mental diseases, especially in general paralysis of the insane. He carried out a series of observations in this disease, and discussed the atrophy of the discs which he found in the *Medico-Chirurgical Transactions* in 1868. He afterwards learnt that von Graefe and others had previously noticed similar appearances in general paralysis, but from a less extensive series of cases. Many of his clinical observations were confirmed by subsequent microscopic observations. He also described the ophthalmoscopic appearances in a large number of cases of tuberculous meningitis, and pointed out that the neuritis in these cases might disappear with recovery from the general disease. It was he who suggested the use of the term "choked disc," now generally used in English ophthalmology, instead of von Graefe's *Stauungs-papille*, for the swollen disc met with in many cases of intracranial disease. Only one edition of the book was published; it was succeeded by the fuller and more extensively illustrated work of Gowers on the same subject, published eight years later.

In 1873 he read before the Royal Society a paper on the effect of exercise on the bodily temperature (*Journ. Anat. and Phys.*, 1873, vol. vii). He had been for some years previously engaged in the study of the temperature of the body in health and disease, and had published his results in various papers. He felt that such a study could only find a satisfactory basis in a knowledge of the temperature of the healthy body, and he knew of no observations on the effects of hard and prolonged exercise on the body. Such



Clifford Allbutt

observations he, however, afterwards heard had been made during ascents of Mont Blanc in 1869. His own investigation was also carried out while climbing in Switzerland in the following year (1870). His conclusions were that the normal effect of exercise was to increase temperature slightly during the day, and to favour the early occurrence of the evening's fall when the day's work was done. When the day's work continued to 6.30 or 7 the fall was postponed until the time of rest, when it quickly set in.

Here we may take the opportunity of mentioning that one of Allbutt's chief recreations as a young man and in early middle life was climbing in Switzerland, a difficult art in which he acquired great skill. He was a member of the Alpine Club. As a boy, and indeed throughout the whole of his life, he was very fond of the Lake Country, and his last published letter, which appeared in the *Times* a week or two ago, was a plea for the preservation of the simple beauties of Grasmere. He enjoyed, indeed, walking anywhere, and was one of the band of Sunday Tramps organized by Leslie Stephen. He took to cycling also in the early days of that recreation, and kept it up till old age; in fact, a few years ago he met with a rather awkward accident while cycling in Cambridge which laid him up for several weeks.

Allbutt published many other important papers on various subjects in the medical journals, but as he rewrote and amplified the most valuable of them for the great medical work with which his name will always be so honourably associated—of which he was editor and driving force—we may refer to them in connexion with this work. The first volume of the *System of Medicine* appeared in 1896 and the last, or eighth, in 1899. Allbutt contributed articles to all of the volumes except the first. Those which he wrote were on grain and mushroom poisoning, opium and other intoxications, mountain sickness, chlorosis, neuroses of the stomach, dilatation of the stomach, scrofula (with Mr. Pridgin Teale), functional disease of the heart, mechanical strain of the heart (title changed to overstress of the heart in the second edition), diseases of the aortic area of the heart, adiposis dolorosa, senile paraplegia, and neurasthenia. These were subjects on which with his large practical experience he could write with authority and illumination, and some of them—especially those on the stomach and heart, and on neurasthenia—were as good and useful as any articles in the whole *System*. The labour involved in the editing of the *System*, which included its planning, the choice of subjects and writers, and the cross-referencing in the articles, even with the unofficial help of Dr. (now Sir Humphry) Rolleston, must have been enormous. The many writers who contributed articles to the *System* were chosen for their special experience in the subjects about which they wrote, and although there was some unevenness in the value of the articles, as must necessarily be where many writers collaborate, the general result was the production of a much needed work of reference of the first order. Its reception by the profession was such that a new edition was soon called for, but as considerable changes and additions were found desirable it was not until 1905 that its first volume could be published.

In producing this second edition Allbutt had the very active and valuable, and this time official, assistance of Dr. Rolleston in the editorial work. The last volume of the new edition was published in 1912. It was more than a mere revision. Inequalities in the first edition were corrected; many new articles were added, and those which required it were brought up to standard form by judicious revision; considerable rearrangement in the order of the articles was also carried out. The bibliography, which is such a valuable feature of the *System*, was carefully revised and the indexes elaborately and accurately drawn out by Dr. A. J. Jex-Blake. This is work which if ill done mars a book, but in the case of Allbutt and Rolleston's *System* the accuracy of this subediting work was very commendable. In the second edition the original eight volumes were increased to nine, and as two of these consisted of two parts, each a separate book, the whole work ran to eleven large volumes. Allbutt himself, besides refreshing his original articles, contributed a new one, with the collaboration of the late Dr. J. F. Payne, on the history of medicine. It is an excellent example of the historical type of article which he wrote so well and with so much pleasure. The *System*, especially the second edition of it, is one that the medical literature of any language could be proud of, and must stand as a worthy monument to its originator and first editor. We may refer more fully to some of his more important articles in the *System*.

Allbutt's opportunities for studying the effects of overstress on the heart—first, among the manual workers at Leeds, and, secondly, among the athletes at Cambridge University—were unusually wide, including as they did two different types of hard muscular labour, forced and voluntary, at different ages and under vastly different conditions of feeding and training. He divided his subject into three parts—namely, static and permanent disease of the heart and arteries, due or attributed to extraordinary effort; dynamic and temporary disorder of like origin; and, thirdly, gradual and almost insensible spoiling of the vascular system due, really or apparently, to the wear of hard muscular labour during long terms of years, especially when the freshness of youth is past. In all three series the problem is complicated by various obscure contingent influences; the first division he dealt with chiefly under the separate heading of diseases of the aortic area; the third was more concerned with diseases of the arteries; and the second formed the main part of this section on overstress of the heart. He defined his subject as being the dynamic change in persons of otherwise healthy body, who by single or persistent exertion may have urged muscular effort to degrees menacing or hurtful to the organs of the circulation, or in whom efforts, if less severe, have told upon a vascular system already somewhat impaired by other causes. The article is a very full account of the subject as it is met with in school and adult life, due credit being paid to the work of other observers in the same field, especially to Dr. R. W. Michel of Cambridge (who was killed in action in 1916). He concluded his long article with the opinion, founded on thirty years of close observation of heart stress, "that the importance of muscular effort as a factor in cardiac injury has been much exaggerated. In the sound adult organism the effects of physical stress upon the heart are promptly counteracted by equilibrating machinery, and especially by large expansion of muscular and pulmonary areas."

The section on diseases of the aortic area of the heart is also very full and authoritative. The most interesting cause to him is apparently overstress. In 1870 he wrote that such acute strains as mountain climbing and the like were apt to tell rather upon the right side of the heart, the chronic effects of years of labour on its left side. Broadly speaking, he always maintained this opinion, but he was well aware that an aortic valve might give way as the result of overstress with consequent disastrous effects on the left heart muscle. The subject of neurasthenia also was one on which he could write with much experience and authority. His article on it in vol. viii of the second edition of the *System* is one of the most useful and practical in the whole work. It occupies sixty pages, and is a most illuminating, thorough, scientific, and instructive account of a condition which in its varied manifestations presents so many difficulties in diagnosis and treatment, and provides the basis for so much argument in law courts.

The effect of exercise on the blood pressure was also a subject that interested him greatly, and to which he devoted a considerable amount of investigation. He found, as did other observers also, that muscular exercise tends in the long run not to raise, but even to reduce, the mean arterial pressure of the twenty-four hours. On the other hand, the blood pressure of men who, as athletic habits are laid aside, lead sedentary lives without denying themselves at least as great an abundance of food, is prone to rise. Under the name of senile plethora or "hyperpiesis," as he called the condition (*Med.-Chir. Trans.*, London, 1903, vol. 86), he described irregular and indefinite variations in health in people beyond middle life which were associated with persistent elevation of the arterial blood pressure. This condition may exist for years, especially if untreated, and may never be associated with renal disease, although both conditions might arise from the same cause. The patients complain of insomnia, cerebral confusion, despond-

ency, and nervousness, but are not necessarily dangerously ill, especially if tension-lowering remedies be prescribed. He recurred to the subject in his contribution to the important discussion on blood pressure in relation to disease, held in the Section of Medicine at the Annual Meeting of the British Medical Association at Toronto in 1906, when he followed the late Professor Gibson of Edinburgh and the late Sir William Broadbent. His paper, which was published in the BRITISH MEDICAL JOURNAL of October 20th, 1906 (p. 1004), contains a summary of his views and a classification of the cases founded on clinical observation.

No one but a man of methodical habit and business capacity could edit successfully such a large work as the *System*, and write so many articles and papers or prepare so many addresses, as the Regius Professor of Physic did. And he was such a man of system and method, constantly watching for any fact, opinion, clinical or scientific observation, or case that interested him, that whenever he came across anything of this nature he made a careful note of it, with the source from which it was obtained and any comment that struck him. This he filed away, either to swell the number of other notes already there, or to form the nucleus of some new batch. It was by such constant vigilance and daily systematic collection of notes that he was able to contribute so much to medical literature. A batch of notes on one subject would form the nucleus of an article, and he wrote them up with a literary skill that made all his papers a delight to read. He had a very extensive command of good English and a wide knowledge of general literature, from which he would draw apposite quotations as sidelights to the subject proper. Aiming at a high standard of writing himself, he desired others to do likewise.

Allbutt was a charming speaker; at first hearing his style seemed loose, but the construction of his sentences, if sometimes complex, was always rigidly correct, and he never failed to convey his meaning with clearness and force. His style, indeed, reflected his mind—full, eager, impetuous, but disciplined. Allbutt once described to a friend how his book *Notes on the Composition of Scientific Papers* came into existence, and the story is characteristic of his sanguine temperament and of his thoroughness. It was his duty as Regius Professor—a duty he most religiously fulfilled—to read a great many theses, and not infrequently his soul was vexed by faults of literary expression and logical arrangement of ideas. On one winter afternoon, when the evil was borne in upon him, he turned to the desk in the big room in which he worked, and picking up half a sheet of notepaper prepared to set out on it certain aphorisms or guiding principles. He failed to get all he had to say on the half sheet of notepaper that day, and turning back to the subject at odd times the notes gradually grew into a book, which may be perused with advantage, not only by the writers of theses and medical articles, but by all who aspire to write on scientific subjects. It appeared first in 1904, and was reissued in 1905; the third edition, long called for, was delayed by the war and other preoccupations until 1923.

The publication fifty-four years ago of his first book, *The Ophthalmoscope in Medicine*, not only taught the profession the value of a new means of investigating disease, but revealed a new clinical observer of the highest promise. It was at this stage of his career that he invented the short clinical thermometer. Realizing the impracticability of the cumbrous instrument, some ten inches long, which was then little more than a curiosity of hospital wards, Allbutt in 1867 instructed a Leeds firm to make him a series of experimental thermometers, with a chamber above the bulb, and managed to reduce the length of the tube to three inches. The pocket clinical thermometer thus devised by him came rapidly into general use. It was a mechanical improvement that greatly helped medical men in their daily work, and the need for it could only have occurred to a physician actively engaged in clinical practice. To those days, too, as already indicated, belonged his epoch-making researches into the cause of certain diseases of the brain and spinal cord, and into the effects of strain on the heart and great vessels. The high expectations built on the originality and the wide grasp of essential principles displayed during this early period were more than justified.

Besides many shorter contributions to the history of medicine, Allbutt published in 1901 *Science and Mediæval Thought*, and in 1905 a collection of lectures delivered in America entitled *The Historical Relations of Medicine and Surgery*. In 1921 appeared *Greek Medicine in Rome*—an expansion of his FitzPatrick Lectures, together with other historical essays. This monumental work he dedicated most appropriately to Sir Norman Moore. It contained abundant evidence that the veteran Regius Professor of Physic had never lost his delight in classical studies, for it was as a classical scholar of Caius College that he began his Cambridge career. The book was regarded by competent authorities as the crown of his labours as a medical historian.

Allbutt was elected a Fellow of the Royal Society in 1880, and served on the council for two periods, 1896-98 and 1914-16, when he was also vice-president. The honours conferred on him by scientific and learned bodies at home and abroad form an imposing list. His honorary degrees included the D.Sc. of Oxford, Manchester, and Leeds; the M.D. of Dublin; the LL.D. of Glasgow, McGill, Toronto, St. Andrews, and Durham, and of his own University. He was a Fellow of the Linnean Society and of the Society of Antiquaries; an honorary member of the American Association of Physicians and of the American Academy of Arts and Sciences; an honorary Fellow of the Royal College of Physicians of Ireland, the New York Academy of Medicine, and the Royal Society of Medicine. He was a member of the Hellenic Society, and had served for some years on the Managing Committee of the British School at Athens. In 1907 he was created K.C.B., and in 1920, during the Annual Meeting of the British Medical Association over which he presided at Cambridge, he was made a Privy Councillor of Great Britain. He was an original member of the Medical Research Council, and from 1908 to 1918 represented the University of Cambridge upon the General Medical Council. The King Edward VII Sanatorium at Midhurst, the Belgrave Hospital for Children, and the Mount Vernon Hospital for Consumption, each counted him among its consulting physicians.

Sir Clifford Allbutt's services to the British Medical Association cover a period of more than fifty-five years. At the Annual Meeting at Leeds in 1869 he was Secretary of the Section of Medicine; he was Vice-President of that Section in 1878 at Bath; President in 1882 at Worcester, when the Association celebrated its jubilee in its native city; and President of the Section again in 1889, when the Association met once more at Leeds. In his Presidential Address to the Section of Medicine in 1882, and again when he delivered the Address in Medicine at the Glasgow meeting of 1888, he pleaded for a broader outlook and demanded that inquiries into the nature and causes of disease should not be limited to man, or even to the animal kingdom, but should extend to plants, which presented in a simpler form problems not dissimilar. At first his was a solitary voice, but he lived long enough to witness the beginning of a realization of his ideals.

When the Association met in 1914 at Aberdeen, on the eve of the war, Sir Clifford was appointed President-Elect. The Annual Meetings were not resumed until 1920, but in 1915 he was reappointed President-Elect; in 1916, a few days after his 80th birthday, he was elected with acclamation President of the Association, and was re-elected year by year until the Annual Meeting of 1921. Thus it came about that Sir Clifford Allbutt held the highest office in the Association for a far longer time than any man had ever held it before, and during that period, notwithstanding the incessant strain of war time—for he was Honorary Colonel Eastern Division R.A.M.C., and did much work in an advisory capacity in many directions—he managed to interest himself in every side of the Association's work, and to attend with great diligence the many meetings to which he was summoned. His long presidency brought him into close and affectionate contact with officers, officials, councillors, committeemen, and representatives. When, a few months after the armistice, a special clinical and scientific meeting of the Association was held in London to discuss and demonstrate the lessons learnt in the war, he opened the proceedings with an illuminating address entitled "The

New Birth of Medicine." In the summer of 1920 the long-deferred Annual Meeting was held at Cambridge. The subject of the Presidential Address was "The University in Medical Research and Practice," but the subject-matter of this singularly suggestive discourse went far, though not unduly far, beyond its title. The Cambridge meeting was a great success; its President, for all his years, seemed ubiquitous, indefatigable, and a source of inspiration to everyone. At this meeting his portrait, by Sir William Orpen, R.A., was given to him, on behalf of an immense number of members of the medical profession. Sir Norman Moore, who made the presentation, aptly described him as a devoted servant of the profession of medicine, deserving a place in the very front rank and side by side with the great ones of the past; one who had never spared himself if he could add to the knowledge of medicine, or stimulate anyone else to add to that knowledge. The portrait now hangs in the Fitzwilliam Museum.* At the Annual Meeting of 1922 in Glasgow Sir Clifford received the Association's Gold Medal, together with an engrossed testimonial setting out the grounds of the award. This opened with the words: "We delight to honour in you a great physician, a great teacher, and a wise friend in counsel," and ended: "In token of our respect and affection for you as a man, of our admiration for you as a physician and teacher, and of our gratitude to you for the generous spirit in which you gave freely of your time and wisdom to the Association during a period of unexampled strain and difficulty, we ask you to accept at the hands of our President the British Medical Association's Gold Medal for Distinguished Merit." During his period of office as immediate Past-President, Sir Clifford attended regularly the meetings of Council, and he continued to serve the Association as a valued member, and for some time chairman, of the Science Committee. He was throughout his professional life a true friend to the BRITISH MEDICAL JOURNAL, helping it in matters great and small with unfailing courtesy and the kindest encouragement. Nor must we forget the powerful support he gave, by pen and by word of mouth, to the insurance practitioners of the country in their long-drawn-out struggle for fair payment and proper professional status.

Sir Clifford Allbutt married in 1869 Susan, daughter of Thomas England of Headingley. They had no children. To Lady Allbutt the sympathy of the whole medical profession goes out in her sorrow.

The funeral service was held on Wednesday, February 25th, in the little chapel of Gonville and Caius College, where William Harvey worshipped and John Caius lies buried. At the same time a memorial service was held in Great St. Mary's Church. The coffin was carried out through the Gate of Honour, and along Senate House Passage and King's Parade to Trumpington Churchyard. At the funeral service the British Medical Association and its JOURNAL were represented by three Cambridge medical graduates: the Association by its President, Mr. J. Basil Hall (Pembroke College), and its Treasurer, Mr. N. Bishop Harman (St. John's); the JOURNAL by the Assistant Editor, Dr. N. G. Horner (Caius). The *Lancet* was represented by the Editor, Sir Squire Sprigge (Caius). The large congregation in the University Church included many personal friends and Cambridge colleagues, and official representatives sent by learned bodies and public institutions throughout the country.

Sir ARCHIBALD GARROD, K.C.M.G., F.R.S., Regius Professor of Medicine in the University of Oxford, writes:

To medical men of any living generation it will be hard to realize that Sir Clifford Allbutt has passed away. To those of us who are senior members of the profession his name was already well known in our youth, and to the young of to-day he has been a leader, counsellor, and guide. Generations of his pupils will retain grateful memories of his teaching and affection for their teacher. His writings, and especially the great *System of Medicine*, which he edited, have gained for him thousands of pupils whom he never saw. At a period of life when most men flag, and claim a well earned rest, Allbutt maintained his bodily vigour; and his keen interest in all the subjects which he had made his own was unimpaired. Despite his years he never grew old. He will be remembered by all who knew him as the ideal physician; as an investigator who approached the study of medicine in a truly scientific spirit; as a scholar, learned in the history and literature of our science and art, and of much which lies outside that field. He held that clear diction and literary form were as desirable in the sciences as in the humanities, and practised what he taught. A knightly figure, and a fitting champion of our aims and ideals, he died, as surely he would have wished, in harness.

Sir HUMPHRY ROLLESTON, Bart., K.C.B., President of the Royal College of Physicians of London, writes:

A friend of my father, Sir Clifford Allbutt had for more than thirty years constantly helped me in innumerable ways, and his sudden death is an irreparable and unexpected break in the established order of things. For though he was in his 89th year he was astonishingly young for his length of days, the only real evidence of age being deafness; in his full sympathy with the young and with fresh ideas and in his broad outlook he indeed compared favourably with many a man of half his years. Aristocratic in appearance and courtly in manner—somewhat resembling the great Lord Dufferin—he was the most approachable of men; obviously a great gentleman, he had indeed a genius for friendship, and I do not think he ever spoke ill of anyone, though he shrewdly estimated the points of character. Like Sir Henry Acland, the Regius Professor of Medicine at Oxford, he had a refreshingly wide and original outlook on medicine, and was more concerned with principles than details. Among his many activities reference may be made to two: his general influence on medical education and culture, and the special subjects in which he initiated advances. He was a scholar in the broadest sense, a profound medical historian, an omnivorous reader, and a persistent advocate of the need for a sound general education as the basis of medical training. With a highly critical literary taste, he was as careful in his own writings as he urged others to be in the choice and use of words. But he was far more than a scholar or a learned man, for his combination of wisdom, humanity, and versatility was of a kind that appears to be dying out in a world that has seen many changes in a comparatively short time. His public addresses were on broad lines and fearlessly independent; thus, in the Goulstonian Lectures for 1884 he satirized the vagaries of the contemporary gynaecologist with a masterly touch, and later, in 1920, expressed his stern disapproval of the practice of psycho-analysis; while in the St. Louis address on the historical relations of medicine and surgery (1905) he insisted on the artificiality of the distinction between the surgeon and the physician. Since his address in medicine at the Glasgow meeting of the British Medical Association in 1888 he had urged the recognition of comparative pathology, and it is a happy outcome of his appeals that there is now an institute for this branch of research at Cambridge, and a Section for its study at the Royal Society of Medicine, of which he was appropriately the first President. No one could write more charmingly of others, as is shown to perfection by his introduction to the volumes dedicated to the late Sir William Osler (1919) and to Karl Sudhoff (1924) on their seventieth birthdays.

He rapidly formed a sound judgement on new work, and was ever alert to welcome the germ of a real advance; thus, in his review (BRITISH MEDICAL JOURNAL, 1902, ii, 250) of the book on the pulse by the then little known James Mackenzie of Burnley he generously described it as destined to "take a permanent place in the standard records of the subject." It is indeed remarkable how many matters of now common knowledge in medicine he either originated or made more widely known, though in some instances his share therein has from lapse of time been, perhaps naturally, forgotten. For many years he described hyperpiesia—or, as he originally called it, senile plethora (1895)—and while so doing was largely responsible for the

* A few copies of the engraving by H. Macbeth Raeburn, after Sir William Orpen's portrait, are still obtainable from the Financial Secretary and Business Manager of the British Medical Association.

introduction of the sphygmomanometer into ordinary practice. His advocacy of the aortic origin of angina pectoris dated from 1894, and those who heard him speak after Professor K. F. Wenckebach's lecture on angina pectoris and the possibilities of its surgical relief at the Royal College of Physicians on May 5th, 1924, were impressed with his mental and physical vigour. He was one of the first, if not the first, to describe syphilitic disease of the cerebral arteries (1868); he was the first in this country to record a case of tabetic arthropathy, a year after Charcot's description in 1868, and he early insisted on the effects of strain on the heart and arteries (1870), on the value of morphine in cardiac disease (1869), on the use of the stomach pump, and of the ophthalmoscope in medicine (1871). Together with the late Mr. Pridgin Teale he advocated the operative treatment of tuberculous glands in the neck (1885), and in 1867 he invented the present short form of clinical thermometer.

Such are a few achievements of the professor, the philosopher, and the physician; but greater even than them were the character and personal influence of the man, the like of whom his friends can hardly hope to see again. He died as he would have wished, in the full tide of his activities; he was to have given the Lloyd Roberts Lecture at the Royal Society of Medicine this autumn, and had a new book ready for the press. Our sorrow is for those left behind: for him there is no feeling but of thankfulness that he had lived so fully and so finely right up to the inevitable end.

In response to our request for a few words from a contemporary in Leeds, Dr. J. E. EDDISON (Woodcroft, Cuckfield, Sussex), Emeritus Professor of Medicine in the University of Leeds, has written as follows:

Sir Clifford Allbutt's time in Yorkshire was one continuous success from beginning to end. If I may presume to speak for the medical profession in Leeds and Yorkshire, I should say that he was singularly welcome for his knowledge of his work, for his kindliness, and for a gracious manner that he retained all his life. His industry was great, and he had the gift of grasping the points of a case that was always a help to the man who called him in. It was a bad day for Leeds when he left us, and I am glad to remember that I did all I could to prevent his departure. If his career at Leeds was (as it was) a great success, his career at Cambridge may be called a triumph. The medical world began to understand how great a physician he was, and he had a wider field in which to show his various accomplishments and his infinite charm of manner. Now and again in recent years he came down into Yorkshire, and I think each visit he paid only increased the regret we all felt that he ever left Leeds.

Professor W. E. DIXON, F.R.S., who was Sir Clifford Allbutt's assessor in the Chair of Physic at Cambridge, has been good enough to send us the following tribute:

Sir Clifford Allbutt at the time of his death was without doubt the most prominent and courtly figure in British medicine. For a third of a century he had been an outstanding personality in Cambridge and one of the most cultured and learned physicians of the times. He leaves behind him a name which passes to history as representative of all that is noble and great in medicine. His charm of manner, kindliness of nature, and graciousness of reception immediately impressed itself on all who came in contact with him.

But apart from this great personality, Sir Clifford was a great man. In his earlier and middle life he had been an active investigator, both experimental and clinical, and in his later years his mature judgement, sense of proportion, and unlimited knowledge of literature enabled him to speak authoritatively on many subjects of medicine, but perhaps especially on cardio-vascular diseases. I remember how pleased and enthusiastic he was about the address Professor Wenckebach delivered before the Royal College of Physicians last May, in which the lecturer said: "Here I knew I would meet the best authority on angina pectoris of this time—your highly honoured, even Right Hon. Nestor of teachers of medicine, my faithful friend in sunny and dark years, Sir Clifford Allbutt." I refer to this only as an example of the standing and authority in which Sir Clifford was held abroad. Experimental evidence has now placed Sir Clifford's theory of angina on a sure basis, and an ever-increasing number of physicians are adopting his views.

Sir Clifford was an omnivorous reader of medicine and science, and was always ready to discuss or criticize any recent hypothesis or view that had been advanced. As a writer he was facile and graceful; he once told me that in all matters of importance he invariably wrote his manuscript three times. The first time the facts were put down crudely, in the second transcript they were put into good English, and in the third the English was given that graceful style which was so characteristic of the master's hand. He advised his students to get their English from Foster or Darwin; Huxley he regarded as too big for them. The kindliness of Sir Clifford's nature was well seen at meetings of his M.D. Degree Committee. On these occasions, whoever the referees for the thesis might be, Sir Clifford himself invariably contributed and read two or more typewritten pages giving his own review of the thesis. In these reports always the good in the thesis was brought to the fore, and he was the most lenient of examiners. Nevertheless, when the thesis had been accepted he ruthlessly informed the successful candidates of their weaknesses, absence of controls, and the like, and if the thesis was really good he would return to the man his own private copy with marginal comments. How he found time to peruse the mass of M.B. and M.D. theses, to take an interest in current subjects of the day, and to read the immense mass of literature—German, English, and French—which he did, was a source of wonder to his juniors.

I often discussed health and longevity with Sir Clifford, and he always insisted that the important factors in good health were moderate exercise, teeth and mouth hygiene (I have even heard him say that all of us at 45 would be better without natural teeth), and nose hygiene.

Sir Clifford was, at all events in the last ten or fifteen years of his life, supersensitive to all kinds of drugs: tea, coffee, and tobacco affected his heart, which even dropped beats if he travelled in a smoking compartment, whilst bouillon at night served to keep him awake. Nevertheless, he was not fastidious, he ate freely of almost everything, though sparsely of meat. Only occasionally did he partake of a little wine, though he was an authority on all that pertained to vintage clarets. A few days before his death he laughingly remarked at dinner that that was always expected from the successful Yorkshire practitioner.

Sir Clifford was the happiest of men; he loved his home, his garden, his work, his University, and his surroundings; exceeding great in his praise of merit in his colleagues and juniors, and tolerant to a fault of their weaknesses. It was the delight of his friends and students to spend Sunday afternoons in his house in the cheery and happy company of himself and Lady Allbutt.

To all who knew him Sir Clifford was not only a great man, but also a great friend, and on Cambridge he has made an abiding impression. Never was honour meted out more worthily than to this, the greatest, humblest, and most beloved physician of our time, whose glory is imperishable.

Dr. H. B. BRACKENBURY, Chairman of the Representative Body of the British Medical Association, writes:

Tributes to Sir Clifford Allbutt's personality and work will come from all branches of the profession. Among these there must certainly be some on behalf of general practitioners and, perhaps especially, of insurance practitioners. Sir Clifford's understanding of the difficulties of these practitioners was remarkable. His appreciation of their opportunities and achievements was always ready. He regarded their work as of the highest importance to the profession and to the public, and was genuinely interested in it. He showed this in many ways. During the four years that he was a member of the Insurance Acts Committee he attended the meetings frequently, and unreservedly placed all his great influence at its disposal. On several occasions during those years, and since, he wrote short memorandums for the Committee and accompanied them on deputations to the Ministry of Health when matters of great moment were under discussion, and as lately as in preparing the case for the Court of Inquiry, early in

1924, he came readily to the Committee's assistance. His knowledge, foresight, understanding, and help in this sphere, as in others, will long be gratefully remembered. His mere presence, indeed, was always an encouragement, and general practitioners of all classes throughout the empire hold him, and will hold his memory, in the most affectionate regard.

We are indebted to one who knew Allbutt well for the following tribute:

It was delightful to watch Allbutt's keen interest in new projects for the advancement of science in connexion with medicine, but he always maintained, nevertheless, that inspiration for advance in medicine must be derived from observations made upon patients. One of the greatest pleasures of his last few years was the realization of a hope he had long cherished of seeing a school of animal pathology working in the closest relations with a school of human pathology. He was delighted when Professor Buxton was appointed under a grant from the Ministry of Agriculture to develop a school of animal pathology, and still further delighted when the splendid benefaction of the Rockefeller Trustees rendered it possible to erect a new laboratory in which the two branches of pathology could develop side by side. He was a lover of art and music, and fortunately, though he found it difficult to hear conversation in his later years, he retained his power of hearing music, which gave him much delight. I cannot put into words the admiration and love I have, and always shall have, for Allbutt. He was a truly great man, great not only in intellect, but in his heart. He was a severe critic, but I never heard him speak unkindly of anyone.

THOMAS LOWE BUNTING, M.D.Ed.,

Physician in Charge *X*-Ray Department, Sick Children's Hospital, Newcastle-upon-Tyne.

THE announcement of the sudden death of Dr. Bunting, on February 18th, has been received with deep regret by the medical profession of Newcastle and Tyneside. It was known to his intimate friends that his health had recently given cause for anxiety, owing to attacks of precordial pain, which were believed to be anginal. Some months ago he had taken a rest from his professional duties, but he had returned to work and was quietly carrying on when the blow fell. Dr. Bunting was a distinguished graduate of the University of Edinburgh. He was a gold medallist in 1904. The writer of this note had the opportunity of reading the thesis which won this distinction for Dr. Bunting—it dealt with the structure and function of lymphatic glands—and was much impressed by the originality of the views therein expressed, many of which have since been accepted. Dr. Bunting, over thirty years ago, commenced practice in the Scotswood district of the city, where is housed a large proportion of the better paid artisan classes of Newcastle. There he built up a large general medical practice; his services were much appreciated and he was held in high esteem. Eventually he took up the study of radiology and visited various important centres where *x*-ray work was being carried on, and he had already achieved considerable success in the practice of it when the war broke out; this gave him the opportunity he required. He was appointed radiologist to the Northumberland War Hospital at Gosforth. Those of us who were his colleagues have cause to remember his patience, his urbanity, and the great assistance he rendered to the visiting staff. Nothing seemed to be a trouble to him if he could be of service in clearing up a doubtful point in diagnosis.

Dr. Bunting was keenly interested in the politico-social movements of the times. A man of rather advanced views, he did not hesitate to express his opinions, but he never unpleasantly enforced these, nor did he disagreeably differ from an opponent. It was this circumstance which made him so beloved by all, and caused him to be chosen as the mouthpiece of the medical profession when disputable matters had to be considered by a joint body of the profession and insurance, health, or education authorities. At committee meetings on national insurance matters there was no one, quite independently of the subject under discussion and the divergent views expressed, who was more carefully listened to than the subject of this memoir He had a wonderful grasp of the intricacies of the Act, what it could and what it could not do, and as he invariably spoke from conviction the opinions he expressed carried great weight and were received with respect. He was a great believer in and a defender of the panel system.

On February 21st his body was laid to rest in Old Jesmond Cemetery. The members of the medical profession attended in large numbers; the various organizations with which he was connected were well represented, as well as the public generally. The British Medical Association was represented by Dr. R. A. Bolam. Dr. Bunting passed away at the comparatively early age of 57 years, before he had time to enjoy the fruits of the greater success which we all believed was in store for him. He left a widow, one son, and a daughter, who is in the medical profession.

T. O.

R. G. ROWS, C.B.E., M.D.Lond., Hon. D.Sc.Manch.,

Pathologist, Prestwich Mental Hospital.

DR. RICHARD GUNDRY ROWS, who died at Prestwich on January 28th, was born at Tresprisson, Cornwall, the son of Mr. R. G. Rows, chairman of the Cornwall Education Committee. He was educated at Queen's College, Taunton, and shortly afterwards entered University College, London, to study medicine. He graduated M.B.Lond. in 1891, in which year he also took the diplomas of M.R.C.S., L.R.C.P.Lond., and became M.D. in 1892. After a short period in general practice at Reading Rows found his true walk in life. He took up the study of mental disorders, and commenced his life's work at the City Asylum, Birmingham, and after eighteen months there he entered the asylum service of Lancashire, where he found the opportunity of developing the advanced ideas which laid the foundation of his reputation.

A colleague (D.O.) writes:

Rows from the beginning, and while he was in charge of a generously equipped laboratory at the Mental Hospital, Lancaster, based his original investigations on the sure foundation of neuro-pathology. His histological work, his technique, his accuracy, and his criticism, made his opinion of the pathological anatomy of all that concerned morbid processes affecting the nervous system well worth having. On this experience he passed on to the study of functional nervous disorders at a time when a new school of psychiatry was in process of being founded in this country, and his opportunity of assisting this school came during the war. He immediately volunteered, and, under the auspices of the Red Cross Society and the Board of Control, assumed the directorship of the large hospital for shell-shock cases at Maghull, near Liverpool. His task was by no means a light one. He had difficulties to encounter. His outlook, however, was broad, scientific, and vastly sympathetic; but, guided by his training, his wide reading, and scientific insight, he made Maghull such a success that ultimately it became a training school for those who afterwards filled posts under the Ministry of Pensions for the treatment of functional nervous diseases. In addition to all this, his administrative capacity was of the highest, and those who were associated with him spoke in the warmest terms of what they had learnt from him. While in charge of Maghull he held the rank of colonel, and received the C.B.E. and the honorary D.Sc. degree from Manchester University. When he left Maghull he was appointed to two hospitals under the Ministry of Pensions, in which he utilized his experience and inspired a great deal of remarkably useful work. In the spring of 1924 he returned to the Lancashire asylum service at the Prestwich Mental Hospital, where he reorganized the pathological laboratory and at the same time completed a comprehensive work on epilepsy. This was only just finished when, unfortunately, he died unexpectedly, leaving a new and important research incomplete. Rows was a great personality in psychiatry. He was valued as much as a

pathologist as a clinician. His contributions on the inflammatory infections of the central nervous system are well known throughout the world. He was Morisonian Lecturer at Edinburgh in 1920, choosing as his subject "Functional mental illnesses." It was characteristic of Rows's broadmindedness that he broke away from the stereotyped classification of mental disorder. He was right in refusing to pigeon-hole his cases, and he treated each individual case on its own merits with a due regard to individual reactivity. His constant argument was that environment was of more importance than the vague theories of heredity advanced up to the present, and he had a special faculty of entering into the mental conflicts so commonly found in the neuroses. Apart from being a student, Rows's love of outdoor games, of music, and of general literature made him a delightful companion. He was a worker, but played with equal zest, a sportsman in every sense of the term, and combined his capabilities with a becoming modesty. His death has left a gap in psychiatry which will not be easily filled.

The Services.

INDIAN MEDICAL SERVICES.

PAY OF OFFICERS IN MILITARY EMPLOY.

THE Secretary of State for India announces that he has sanctioned the extension to Indian Medical Service officers in military employ of the concessions regarding overseas pay recently introduced for officers of the Indian Medical Service in civil employ and detailed in Statutory Rules and Orders No. 1,395 of 1924, copies of which are obtainable from His Majesty's Stationery Office. The extension has effect from April 1st, 1924. Officers now in the United Kingdom who have been in receipt of rupee rates of pay for any period after this date, and who accordingly have claims for retrospective adjustment under this concession, should address the Controller of Military Accounts by whom they were last paid in India. Indian Medical Service officers in military employ are not eligible for the passage concessions recently introduced for those in civil employ, but will be included in concessions which are being announced separately for the Indian military services.

PASSAGE FOR OFFICERS OF THE INDIAN MILITARY SERVICES.

The Secretary of State for India announces that passage concessions as previously foreshadowed have been sanctioned for officers of the Indian military services. They will apply to any passage beginning on or after February 14th. Detailed rules have yet to be drawn up, but the provisional arrangements, which have been approved, are being communicated by the India Office to all officers concerned who are now under the orders of the India Office.

Universities and Colleges.

UNIVERSITY OF OXFORD.

AN examination for the Theodore Williams scholarship, value £100 a year, and tenable for four or five years, will begin on June 9th. Full particulars can be obtained on application, before May 9th, to the Senior Tutor, Pembroke College, Oxford.

UNIVERSITY OF LONDON.

ELECTION TO SENATE.

THERE are two candidates for election to the Senate to represent the Faculty of Medicine: Sir Holburt Waring, M.B., B.S., F.R.C.S., surgeon to St. Bartholomew's Hospital, the sitting member, who was until recently Vice-Chancellor; and Sir G. Lenthal Cheatle, K.C.B., F.R.C.S., surgeon to King's College Hospital. Sir Holburt Waring is understood to be in favour of the Haldane report; Sir Lenthal Cheatle pledges himself to "oppose the Haldane recommendations root and branch, and to support the authority of the medical faculty on every occasion."

ST. THOMAS'S HOSPITAL MEDICAL SCHOOL.

Puerperal Sepsis.—A course of four lectures on puerperal sepsis will be given at St. Thomas's Hospital Medical School by Professor B. P. Watson, M.D., F.R.C.S.Ed. (Professor of Midwifery and Diseases of Women in the University of Edinburgh), at 5 p.m. on March 2nd, 3rd, 4th, and 5th. At the first lecture the chair will be taken by Dr. H. Russell Andrews, senior obstetric physician to the London Hospital. Admission to these lectures will be free.

UNIVERSITY COLLEGE.

Vital Statistics.—A course of two lectures on vital statistics will be given at University College by Professor Harald Westergaard (late Professor of Political Economy in the University of Copenhagen) at 5.30 p.m. on March 9th and 11th. The lectures will be delivered in English. Admission will be free.

Primary Fellowship Examination.—A special course for the Primary Fellowship of the Royal College of Surgeons of England, in preparation for the June examination, will begin at University College on Monday, March 2nd.

UNIVERSITY OF BRISTOL.

THE following candidates have been approved at the examination indicated:

FINAL M.B., CH.B. (PART II).—*†Dorothy E. Crellin, *†‡Constance I. Ham, *§‖A. H. Lowther, *†Rosalie E. Lucas, A. F. Alford, K. F. Alford, A. S. Cox, S. J. H. Griffiths, F. H. Hollingshead, J. A. Hooker, K. F. Platt, D. C. Prowse, §L. G. Robertson, H. Rogers, Gertrude M. Terrell, Maria M. Tewater. *In Medicine (completing examination):* E. R. Clutterbuck. *In Surgery (completing examination):* Helen M. Dixon. *In Public Health (completing examination):* Elizabeth E. Benson, Margaret P. Posthuma, H. J. Satchwell, Kathleen M. Willmore. *In Group II only (Surgery and Obstetrics):* Elizabeth E. Benson, Margaret P. Posthuma, H. J. Satchwell, Kathleen M. Willmore. *In Group II only (Pathology, Medicine, and Public Health):* C. F. R. Killick.

PART I (*including Forensic Medicine and Toxicology*): G. W. R. Bishop, J. F. O. Bodman, Muriel E. Drew, F. S. Dymond, G. L. Feneley, F. R. Gedye, A. P. Gorham, Mildred B. Harvey, T. P. Lalonde, M. E. J. Packer, C. B. Perry, L. B. Phillips, E. S. Rogers, A. A. B. Vincent.

D.P.H.—V. Ryan. *In Part II (completing examination):* J. Ledingham. *In Part I only:* Nora A. McD. Rodger, W. W. S. Sharpe.

* With second-class honours. † Distinction in medicine.
‡ Distinction in surgery. § Distinction in obstetrics.
‖ Distinction in pathology.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

AN ordinary council meeting was held on February 12th, when the President, Sir John Bland-Sutton, was in the chair.

Diplomas.

Diplomas of Membership were granted to 208 candidates. Diplomas in Ophthalmic Medicine and Surgery were granted jointly with the Royal College of Physicians to nine candidates. (The names were printed in the report of the comitia of the Royal College of Physicians of London, published in our issue of February 7th, p. 289.)

Diplomas of Fellowship were granted to two candidates (Frederick H. Scotson and Clement Sturton), who, having previously passed the examination, had now attained the age of 25 years.

Court of Examiners.

Mr. A. P. Dodds-Parker, surgeon to Radcliffe Infirmary, Oxford, was elected a member of the Court of Examiners in Surgery in the vacancy caused by the retirement of Mr. John Murray.

Lecturers.

Mr. James Sherren was appointed Bradshaw Lecturer and Professor Wright was appointed Thomas Vicary Lecturer for the ensuing year. The subject of the Thomas Vicary lecture will be "The mediaeval conception of the anatomy and physiology of the central nervous system."

Vote of Thanks.

The best thanks of the Council were given to Mr. H. R. Hope-Pinker for his gift of a plaster model of his bust of the late Sir George M. Humphry.

Council Election.

A meeting of the Fellows will be held at the College on Thursday, July 2nd, at 2.30 p.m., for the election of three Fellows into the Council in the vacancies caused by the retirement in rotation of Mr. V. Warren Low, Mr. James Sherren, and Sir John Lynn-Thomas. Notice of the meeting will be given to the Fellows by advertisement and by circular on March 6th. March 16th will be the last day for the nomination of candidates, and a voting paper will be sent to every Fellow whose address is registered at the College on March 31st.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have passed in the subjects indicated:

SURGERY.—J. H. Clapp, J. L. Hopkins, O. W. Percival, C. C. Po, J. Shutt, R. F. Stubbs, B. Temple-Raston.

MEDICINE.—K. V. Mead, C. C. Po, P. B. Skeels, B. L. Steele, R. F. Stubbs.

FORENSIC MEDICINE.—A. Henson, K. V. Mead, T. K. Natesan, R. F. Stubbs.

MIDWIFERY.—N. E. Challenger, T. K. Natesan, O. W. Percival, C. C. Po, J. Shutt, B. Temple-Raston, L. Waynik, G. H. Weeber.

Medico-Legal.

ILLEGAL PRACTICE BY A DRUGGIST.

A CASE was recently heard in the Nuneaton County Court, before Judge Staveley Hill, in which the Society of Apothecaries of London were plaintiffs and Mrs. Ashton of the Coton Drug Stores, Nuneaton, was the defendant.

The action was brought under the Apothecaries Act, 1815, to recover a penalty of £20 from the defendant for having acted as an apothecary without qualification. From the evidence it appeared that the defendant had treated a child for a cold who was suffering from small-pox, and that as the result of the failure of the defendant to diagnose the disease correctly other people had been infected. The Judge said that, having carefully considered the authorities, he was of opinion that the defendant had brought herself within the statute, and gave judgement in favour of the plaintiffs for the penalty and costs. A stay of execution was granted for fourteen days.

Medical News.

THE programme has now been issued for the fifth International Congress of the History of Medicine to be held at Geneva from July 20th to 25th, as announced in our issue of October 11th, 1924. On the first day, after addresses by the president of the congress, the president of the Medical Society of Geneva, and others, M. Eugène Pittard, of the Geneva University, will open a discussion on prehistoric medicine with an illustrated lecture on operations in the Stone Age. In the evening a reception will be held by the president of the congress, Dr. C. G. Cumston. Other subjects to be considered include "Albert von Haller and the *disputationes chirurgicae selectae*," by Sir D'Arcy Power; "Robert Whytt, an eighteenth century neurologist," by Dr. J. D. Comrie; the history of typhoid fever in the child, by Professor P. Gautier; a letter of Tronchin and the Suttonian method of inoculation, by Dr. J. G. de Lint; "Voltaire and medicine," by Dr. J. D. Rolleston; "Goitre and Geneva in the Middle Ages," by Dr. E. Wickersheimer; "Lavater and his successors," by M. Fosseyeux; a note on the history of diagnosis in medicine, by Dr. F. G. Crookshank; a letter of Girolamo Fracastoro on poetry, by Dr. J. W. S. Johnsson of Copenhagen; historical researches in the history of anatomy in the Ateneo Romano, by Dr. P. Capparoni; medical literature of the seventeenth century, as exemplified in the Elzevir Press, by Dr. E. B. Krumbhaar; hygiene and public health in the early civilizations, by Mr. C. J. S. Thompson; the origin of veterinary art, by Sir Frederick Smith; the history of magic in the cure of disease, by Professor Jeanselme; Martin Luther and his noises in the ear, by Professor G. Bilancioni; a medical congress at Rome in 1681-2, by Dr. C. G. Cumston; and Benjamin Waterhouse, an American pioneer, by Dr. J. W. Courtney. On July 23rd an excursion will be made round the lake, visiting the Château of Chillon and the baths of Evian. The subscription, including the cost of excursions and a dinner on July 24th, is 45 Swiss francs. Further information can be obtained from the general secretary, Dr. A. de Peyer, Rue Général Dufour, Geneva.

THE National Union of Scientific Workers informs us that the decision of the Treasury to provide in the estimates for 1925-6 an increase in the grant to the Royal Society towards the cost of scientific publications from £1,000 to £2,500 was due to its representations. It is not intended that the Royal Society should spend the grant on its own publications, but that it should administer it for the benefit of such societies as the Biochemical, the Chemical, and the Geological, which are hard put to it to find money for making the publication of reports the results of researches presented to them. The union, which was started in 1918 to watch the economic interests of scientific men, has its offices at 25, Victoria Street, S.W.1. Its position with regard to the scientific professions is described as corresponding with that of the British Medical Association towards the medical profession. In its relations with Government departments its claim that scientific men should be placed on the same footing as members of the other professions has been largely successful. A similar campaign is being conducted to convince the large industrialists of the benefits to industry arising from the employment of scientific workers.

THE Fellowship of Medicine announces that Sir Arbuthnot Lane will preside at a discussion on post-graduate teaching in London to be held at No. 1, Wimpole Street, on March 18th, at 6 p.m., and open to all members of the medical profession in London. On March 2nd, at 5.30 p.m., Professor H. Maclean will give a lecture on renal disease, its diagnosis and treatment, at the Royal Society of Medicine. A three weeks' course in medicine, surgery, and gynaecology will begin at the Royal Waterloo Hospital on March 2nd, with special reference to gynaecological diagnosis, hernia, diseases of the stomach, intestines, etc. From March 4th to 28th Dr. Frederic Thomson will give a series of demonstrations on the diagnosis and treatment of the acute infectious diseases at the North-Eastern Fever Hospital on Wednesdays and Saturdays at 11 a.m. The Central London Ophthalmic Hospital has arranged an afternoon course in ophthalmology from March 9th to April 4th; for those desiring operative work a class can be arranged. From March 16th to 28th the Chelsea Hospital for Women will hold a course in gynaecology, and at the Brompton Hospital for Diseases of the Chest there will be a fortnight's course to include artificial pneumothorax, bronchitis, demonstrations of cases, *x*-ray work, protein tests, and the varying phases of chest affections. The Royal Northern Hospital, in conjunction with the Royal Chest Hospital, will hold an intensive course in medicine, surgery, and the special departments from March 16th to April 4th. Copies of the syllabus of these courses may be obtained from the secretary to the Fellowship, No. 1, Wimpole Street, W.1.

SIR W. I. DE COURCY WHEELER (Dublin) completed on February 19th a course of four advanced lectures in surgery at St. Bartholomew's Hospital. The subject chosen was "Fractures of the pelvis and lower extremity treated by conservative methods." The lectures, delivered under the auspices of the University of London, were illustrated by numerous lantern slides.

AT the meeting of the Medical Officers of Schools Association on Friday, March 6th, at 4.30 p.m., at 11, Chandos Street, Cavendish Square, a discussion will be opened by Dr. E. W. Goodall and Dr. G. E. Friend on the differential diagnosis of scarlet fever, rubella, measles, and allied rashes.

A MEETING of the Röntgen Society will be held at the British Institute of Radiology, Welbeck Street, London, W.1, on Tuesday, March 3rd, at 8.15 p.m., when a paper on the photometry of fluorescent screens will be read by Leonard A. Levy, D.Sc., and D. W. West, A.I.C.

A MEETING of the Royal Sanitary Institute will be held at the Town Hall, Halifax, on Friday, March 6th, at 4 p.m., with Professor A. Bostock Hill, M.D., in the chair. Two discussions will take place, one on the working of the Milk and Dairies (Amendment) Act, 1922, which will be opened by Mr. John Pollard, M.R.C.V.S., veterinary inspector, and the other on some food dangers, by Mr. H. T. Lea, M.Sc., borough analyst. On the morning of Saturday, March 7th, visits will be paid to certain manufactories and in the afternoon to the corporation salvage plant for domestic refuse and the Bermerside Open-air School and Home.

ON the recommendation of the Society of Medical Officers of Health, the Ministry of Health has nominated Dr. James Fenton, M.O.H. Kensington, and Dr. Alfred Greenwood, M.O.H. Kent, for the interchange of health officers to Jugo-Slavia during May and June next under the auspices of the Health Section of the League of Nations. For the interchange in Belgium about the same time the Society recommended Dr. R. J. Maule Horne, M.O.H. Poole, who has been duly nominated by the Ministry. On the recommendation of the Chief Medical Officer of the Ministry of Home Affairs of Northern Ireland, the Ministry of Health has nominated Dr. Norman C. Patrick also for the Belgian interchange.

SIR AUCKLAND GEDDES, President of the Society for the Prevention of Venereal Disease, will head a joint deputation of the National Council for Combating Venereal Diseases and the Society for the Prevention of Venereal Disease which the Minister of Health has consented to receive on March 3rd. The object of the deputation is to urge the Minister of Health to give effect to the recommendation of Lord Trevethin's Committee "that the law should be altered so as to permit properly qualified chemists to sell *ad hoc* disinfectants provided such disinfectants are sold in a form approved and with instructions for use approved by some competent authority."

A PORTRAIT of Dr. Isabella M. Macdonald, painted by George Harcourt, A.R.A., has been presented by her friends and patients to the Elizabeth Garrett Anderson Hospital as a memorial of her work there for several years as senior physician.

DR. P. MAUCLAIRE, surgeon to the Hôpital de la Pitié, Paris, has been elected a member of the Académie de Médecine and Professor Barthe of Bordeaux a corresponding member.

THE second Franco-Polish Medical Congress, due to the initiative of the Franco-Polish Medical Society of Warsaw and the Franco-Polish Medical Committee of Paris, will be held in Paris, under the presidency of Professor Roger, dean of the medical faculty, next April, and will be followed by visits to Lyons, Vichy, Strasbourg, and Nancy. Further information can be obtained from the general secretary, Dr. Hufnagel, 10, Rue Freycinet, Paris XVI^{e}.

THE fifth international congress for the protection of infancy will be held at Madrid from April 12th to 20th, under the presidency of Professor Martinez Vargas, rector of the University of Barcelona, who is also president of the International Union for the Protection of Infancy. Further information can be obtained from Dr. Bardelac de Pariente, 10, Square Moncey, Paris.

THE fifth Salon des Médecins will be held from March 8th to 20th, at 117, Boulevard St. Germain, Paris, for the exhibition of paintings, sculpture, engravings, and sketches by medical men, veterinary surgeons, pharmacists, and members of their families. Further information can be obtained from the Secretary, Dr. Paul Rabier, 84, Rue Lecourbe, Paris XV^{e}.

THE fall in the number of medical students in Germany is shown by the following figures given in the *Deutsche medizinische Wochenschrift*. In the winter term 1922-3 there was a total of 13,489 students, of whom 1,736 were women, and 2,204 foreigners, of whom 336 were women; while in the summer term of 1924 there was a total of only 9,316 students, of whom 1,373 were women, and 1,962 foreigners, of whom 280 were women.

THE West African Medical Staff List, revised up to the end of January, 1925, may be obtained from the Crown Agents for the Colonies, 4, Millbank, S.W.1. Three lists are provided, officers being classed in grades, according to colonies, and according to their qualifications and services.

MESSRS. W. HEFFER AND SONS, publishers and booksellers of Cambridge, have issued a catalogue of new and recent scientific books published by them, or of which they have copies for sale. It is arranged under suitable headings, ranging from mathematics and physics to physiology, anatomy, and medicine. It also contains a list of portraits of men of science the firm has for disposal, and a list of complete sets of journals which can be obtained from them. Copies of the catalogue can, we presume, be obtained from them at 4, Petty Cury, Cambridge.

ON his retirement from the post of medical officer of health for Hornsey to take up a similar appointment at Plymouth, Dr. A. T. Nankivell has been presented with an inscribed silver cigarette box by the Mothers' and Fathers' Committee of the Hornsey Maternity and Child Welfare Centre.

IN consequence of the outbreak of plague in the Sitapur district, the Government of India has instructed the railway authorities to cancel special trains in connexion with the religious fairs at Nimsar and Misrikh.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.* Authors desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Financial Secretary and Business Manager, 429, Strand, W.C.2, on receipt of proof.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—not necessarily for publication.

ALL communications with reference to advertisements as well as orders for copies of the JOURNAL should be addressed to the Financial Secretary and Business Manager, 429, Strand, London, W.C.2. Attention to this request will avoid delay. Communications with reference to editorial business should be addressed to the Editor, BRITISH MEDICAL JOURNAL, 429, Strand, W.C.2.

Communications intended for the current issue should be posted so as to arrive by the first post on Monday or at latest be received not later than Tuesday morning.

THE telephone number of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is Gerrard 2630 (Internal Exchange). The telegraphic addresses are:

EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westrand, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westrand, London.*

MEDICAL SECRETARY, *Mediocera Westrand, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 4737 Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 4361 Central).

QUERIES AND ANSWERS.

SNORING.

DR. C. W. M. CAMBRON (Grantham) writes in reply to "Wiltshire": In late adult life the muscles which keep the mouth closed tend to relax in sleep more than they do in earlier life and allow the jaw to drop, with the result that the person breathes mainly through the mouth. This causes the soft palate to flag, which produces the snoring noise. I think if "Wiltshire" were to use an elastic chin-strap at night for his patient he would get a satisfactory result.

INCOME TAX.

"G. R. H." inquires as to the calculation of the amount of profits made on letting a house furnished.

*** The following expenses are deductible: rent, rates, repairs, agents' fees, and a reasonable amount for use of furniture, say 5 per cent. per annum on the insured value. If the house is owned by the person letting, then in lieu of rent the amount assessed to income tax, Schedule A, is deductible. In addition to the above, any wages paid for gardener and so on would be deductible. With regard to any articles for daily use specially purchased for the use of the tenants and likely to wear out during the period of letting, we think that the inspector of taxes may object that any such allowance would be covered by the general wear and tear allowance based on the insured value of the contents of the house. It may be worth while to claim the deduction, but whether the claim can be successfully pressed depends on the whole of the facts.

LETTERS, NOTES, ETC.

CENTRAL MIDWIVES BOARD.

THE Secretary of the Central Midwives Board for England and Wales writes with reference to the paragraph in our issue of February 14th (p. 329) to say that out of nine bodies which send up representatives to the Board, representatives from only three have been reappointed up to the present.

PLEASANTRIES AT BATH.

IN view of the Annual Meeting of the Association being held this year in Bath, the following verses, from *Eccentric and Humourous Letters*, an olla podrida concocted in 1824, may interest and perhaps amuse.

At the time that Dr. Cheyne and Dr. Winter were the two principal physicians at Bath, they adopted very opposite modes of practice; but the former gained some credence for his prescription of milk diet by making it the principal article of his own sustenance. On this occasion Winter wrote him the following stanzas:

To Dr. Cheyne.

Tell me by whom, fat-hea'ed Scot,
Thou didst thy system learn;
From Hippocrate thou hadst it not,
Nor Celsus, nor Pitcairn.

Suppose we own that milk is good,
And say the same of grass;
The one for babes and calves as food,
The other for an ass.

Doctor, one new prescription try;
A friend's advice forgive:—
Eat grass, reduce thyself, and die,
Thy patients then may live.

To this effusion Dr. Cheyne replied as follows:

My system, Doctor, is my own,
No tutor I pretend;
My blunders hurt myself alone,
But yours your dearest friend.

Were you to milk and straw confined,
Thrice happy might you be;
Perhaps you might regain your mind,
And from your wit get free.

I can't your kind prescription try,
But heartily forgive;
'Tis natural you should bid me die,
That *you* yourself may live.

Dr. George Cheyne, the target of Dr. Winter's shafts of wit, was a native of Aberdeenshire, and was born in 1671. He was at first intended for the ministry; his leaning, however, was towards medicine, and he was persuaded to adopt that profession by Dr. Pitcairn, under whom he studied. Having obtained the the degree of M.D., he commenced practice in London, though without belonging to the College of Physicians. On coming to London he suddenly changed his former temperate, sedentary habits, and frequented the society of "the younger gentry and free livers," with whom he became extremely popular, for he had a genial temper and a ready wit. This life was greatly to his liking—it was not only pleasant but was of use in bringing him professional business; it, however, aggravated a natural tendency to corpulence, which, with other troubles, caused him much distress. He therefore abandoned his free habits of living and adopted a rigorous moderation, which brought some alleviation but cost him the loss of his pleasant companions and a good deal of his professional work. His health was eventually fully restored after a course of the Bath waters. Some time later he relinquished his abstemious for a "moderate" diet, and his old enemy, corpulence, so gained upon him that he eventually attained the enormous weight of 32 st. and was hardly able to walk. To reduce his weight he adopted for the remainder of his life a milk and vegetable diet; it is to be gathered, too, that he recommended this regimen to his patients, which seems so to have roused Dr. Winter's ire that he penned the gibe printed above.

Dr. Cheyne was a voluminous writer, though few of his works were purely medical. It was one of his earliest works, *Fluxionum Methodus Inversa*, one authority asserts, that procured his admission to the Royal Society.

CORRECTION.

DR. R. H. COLE asks us to correct two errors which appeared in the summary of his address, delivered before the Kensington Division, on "The present legal disabilities in the early treatment of mental disorders," published last week at page 357. In column 1, line 15 from foot, for "1884–5" read "1844–5." In column 1 of page 358, line 22 from top, for "and rate-supported hospitals" read "but not over rate-supported hospitals." The Board of Control has no power over rate-supported mental hospitals.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 44, 45, 48, and 49 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 46 and 47.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 83.